JULY, 1945

Industrial FINISHING

PUBLIC LIBRARY
JUL 1945
DETROIT

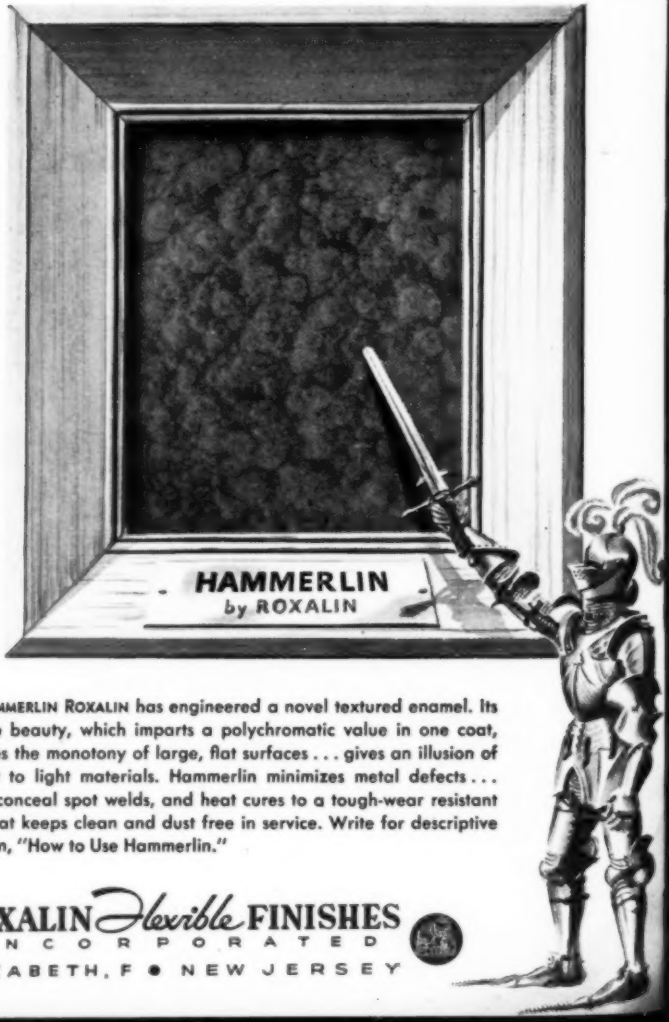
Know and Recognize This SERVICE BUTTON

The wearer of this official emblem has served in our Armed Forces during World War II and has received his or her honorable discharge.

The Lilly Varnish Company wishes to pay tribute to returned veterans now wearing this button and also to express humble gratitude to the millions still in service.

LILLY VARNISH COMPANY
Indianapolis, Indiana
THE LILLY COMPANY, High Point, North Carolina

A Masterpiece of Beauty from an Old Master



IN HAMMERLIN ROXALIN has engineered a novel textured enamel. Its unique beauty, which imparts a polychromatic value in one coat, relieves the monotony of large, flat surfaces . . . gives an illusion of weight to light materials. Hammerlin minimizes metal defects . . . helps conceal spot welds, and heat cures to a tough-wear resistant film that keeps clean and dust free in service. Write for descriptive bulletin, "How to Use Hammerlin."

ROXALIN *Flexible* FINISHES
INCORPORATED
ELIZABETH, N. J. • NEW JERSEY

EBONOL-Z

passivates

ZINC SURFACES

For Organic Finishing

EBONOL "Z" forms a passive oxide film on zinc surfaces that inhibits action between the active zinc and the organic finish. EBONOL "Z" is easy to operate. The zinc surface is alkali cleaned and then immersed in the EBONOL "Z" solution for five minutes. The result is a continuous inert black oxide coating—an excellent finish in itself—and an ideal, stable base for air-dry or bake paints, lacquers or enamels.

One big advantage in treating zinc electrodeposits is that only a small amount of zinc is removed during operation. Zinc die castings are easily and economically processed in bulk to coat them with the passive EBONOL "Z" finish. Material cost is only 1/3 cent per square foot of area treated.

Other advantages described in new 8-page booklet "Blackening and Coloring of Non-Ferrous Metals."

THE ENTHONE CO., 441 Elm St., New Haven 2, Conn.

ONE OF THIRTY-ONE METAL FINISHING CHEMICALS MADE BY

ENTHONE

DURANITE

The Production Finish

DURANITE really *protects* metals. Its resistance h
been proved by exacting laboratory tests—and in actu
use! Remember, Duranite is a plastic base productio
finish. It comes in both clears and colors for spray, d
or roller-coat application—for infra-red or oven bakin

ZAPON

ZAPON DIVISIO
ATLAS POWDER COMPAN
Eastern Sales: Stamford, Conn. Western Sales: No. Chicago

SPECIALIZED PRODUCTION FINISHES . . . *Doing Tomorrow's Job Tod*

TWENTY-FIRST YEAR OF PUBLICATION

Industrial FINISHING

W. H. ROHR, Editor E. A. DOSCH, Assoc. Editor

Vol. XXI, No. 9 JULY, 1945 $2.00 a Year

Contents of This Issue

Letters from Readers 4
Trick Finishes 26
Cleaning of Metals for Production Painting 32
Quality Control Through Production Records 44
Conveyorized Finishing 50
Cleaning, Painting, Drying Setup for Steel Cabinets 60
Finishing Technique for Prefabricated Homes 81
Silk Screen Stenciling 88
My Experience in Finishing Gum Furniture 92
Coating Armored Electric Cables for Ships 98
Questions and Answers 104
Materials; Supplies; Equipment 116
Editorial 122
Random Comment on the Industrial Scene 130
"Classified Advertising" Section 143
Index to Advertisers 144

Wire Brushing Small Metal Parts ... 38
Colors You Like Are Classified ... 42
Metal Cleaning Service Schools ... 42
Vita-Var Receives Second Army-Navy "E" ... 48
Cool Air Intake for Air Compressor 56
American-Marietta Advances William M. Gibson ... 58
Color Conditioning of Industrial Interiors ... 75
Fixing Marred Surfaces of Plastics 78
Painted Machines as a Safety Feature ... 78
Hilo Wins Second Army-Navy "E" 78
Bonus Pay for Suggestions ... 84
Colors Designating Pipe Lines ... 90
Sinclair & Valentine Co. Expand Coatings Division ... 90

Dr. N. W. Taylor Joins 3M Co. ... 102
W. A. McKim Joins Roxalin ... 102
Paint Spray Hose ... 102
Protective Coatings Chapter ... 102
Electrostatic Spraying Paper ... 102
Pierce & Stevens, Inc., Transfers J. H. Dodds ... 102
One-Story Factories Are More Desirable ... 114
Book on Plastics ... 114
Rollin H. Wampler Joins Jones-Dabney Co. ... 134
Colors Produced by Mixing Paints ... 136
Metal Smoothness Gauged by Plastic ... 140
Fixtures Hold Small Parts for Spraying ... 142

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Letters from Readers

Dipping Equipment

Bignell Machine Co., Grand Rapids, Mich., has suggested contacting you regarding the names of concerns manufacturing conveyor dipping systems. If you could give us a list of concerns in this business, it would be greatly appreciated, as we are starting a new project which will require an entirely new line of equipment.—E. ELSCT. CO.

Porcelain Enameling

I would like some information as to the process and procedure for putting a porcelain enamel finish on aluminum. I would appreciate any assistance that you can give me or any names of companies that you can supply that would be able to give me this information. —P. S.

We suggest that you communicate with Ferro Enamel Corp., Cleveland 5, Ohio.—ED.

Sprayed Plated Finish

Please let us know the name of the firm manufacturing sprayed plated finish.—STEEL EQUIPMENT CO.

This is a product of an advertiser—the Maas &Waldstein Co.—ED.

Food Mill Coating

We are in receipt of the following letter from a manufacturer of various kitchen specialties, which we quote to you in the hope you will be able to furnish the desired information. Your reply will be sent direct to the company making the inquiry.

"The food mill for restaurants and hotels, the family food mill for home use, the strainer, and our 2-cup flour sifter, are all manufactured of carbon steel, which is hot tinned. The chopper and fork are nickel plated.

"Owing to the fact that tin comes from the Strait settlements, which are in the hands of the Japanese, we can only secure a very limited allotment of tin. Nickel is also on the critical list, and nickel may not be used in the manufacture of kitchen utensils.

"Regular baked enamel finish cannot be used on the food mill because the inside of the food mill must have rough edges around the holes to prevent the food from sliding around. Enamel ware would chip, with the constant agitation of the revolving paddle.

"Our problem is, what can we use as a coating other than tin and nickel?"

We will deeply appreciate any suggestions you may give which will aid this company in solving their problem. References to other authoritative sources where we may obtain additional information will be gratefully received.—INDUSTRIAL RESEARCH.

What we think of at the moment is a black oxide finish—a chemical finish applied by immersion of the parts into very hot solutions. Names of manufacturers are being sent you by letter.—ED.

Where to Get "Nu-Film"

Will you please tell us where we can get "Nu-Film," which is mentioned in the article on silk-screen stenciling, on page 88 of June issue of INDUSTRIAL FINISHING?—C. X. CO.

Try Nu-Film Products Co., 56 W. 22nd St., New York, N. Y.—ED.

"Hammered" Finishes

We would appreciate it very much if you would send us samples and information on hammered-finish enamels and lacquers. Also please advise us as to the name of the manufacturer of the finish known as "Hammeroid".—D. S. CO.

Names of manufacturers are being submitted by letter.—ED.

Cedar Spray for Clothes Closets

We are interested in learning of some concern that supplies a preparation made of cedar wood flour that can be sprayed, transforming any ordinary closet into a cedar closet. We

(Continued on page 8)

Dolan's

OPALESCENT

Pearl Finishes

FOR
Bric-a-brac
Figurines
Novelties
Cabinets
etc.

A beautiful range of UNUSUAL effects and colors in smooth and "hammered" finishes.

NEW AND DIFFERENT

V. J. DOLAN AND COMPANY, INC.

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Manufacturers of
"UNQUESTIONABLE QUALITY," Industrial Finishes

I. C. D. FORMULA NINE

NON-INFLAMMABLE « *wax free* REMOVER »

for paint, varnish, lacquer, baked enamel, adhesives

EASY TO APPLY—NO AFTER-CLEANING

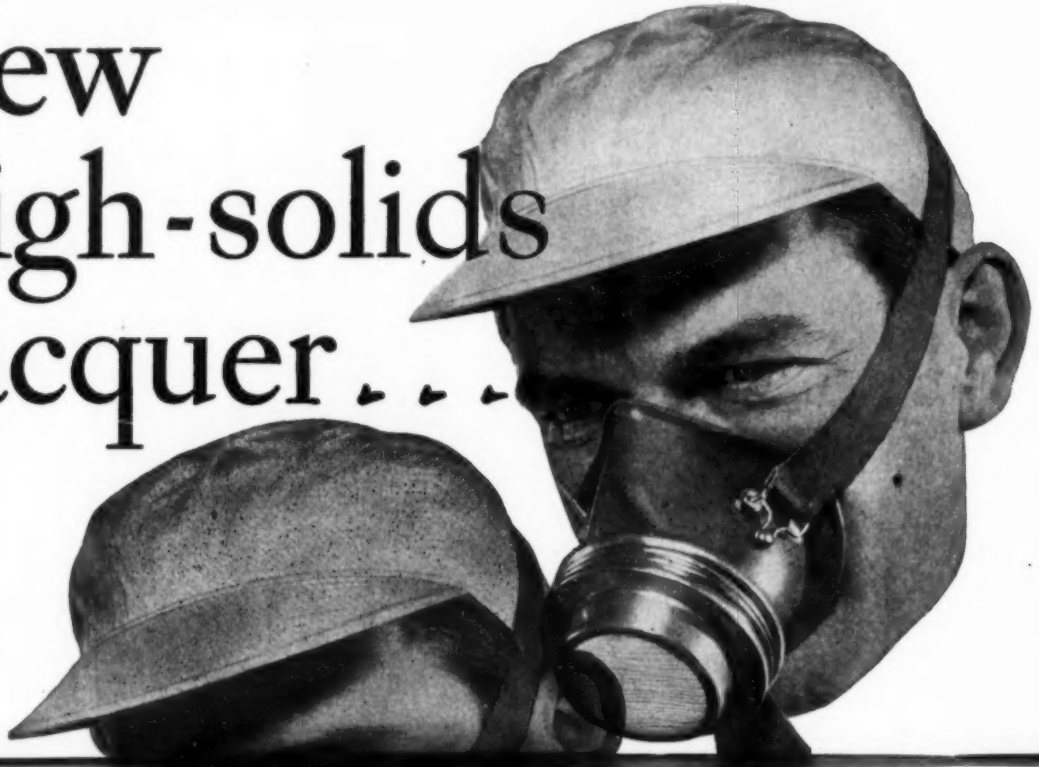
ORDER TRIAL GALLON AT DRUM PRICE

I. C. D. FORMULA 9 is the standard of safety and quality . . can be sprayed or brushed . . doesn't raise grain nor discolor . . quickly removes all kinds of finishes and coatings . . costs less to use . . saves time, labor and material.

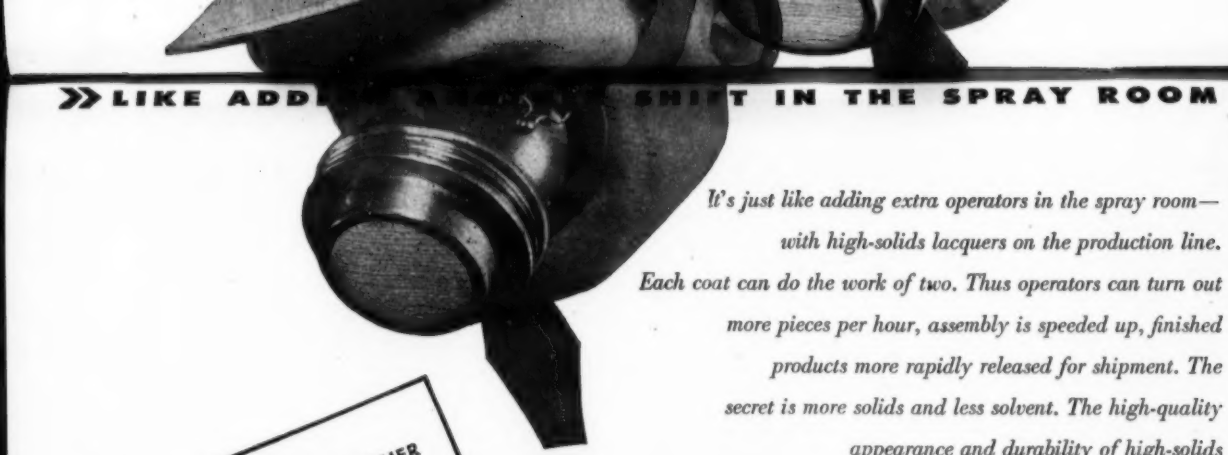
SPECIALTY COATINGS—I. C. D. Labs. have specialized in the formulation and manufacture of non-inflammable coatings and substitute finishes. If you have a tough coating or finishing problem send in your specifications, finishing schedule and requirements. Immediate action and a prompt reply promised.

INDUSTRIAL CHEMICAL DEVELOPMENT CORP.
347 MADISON AVE. NEW YORK 17, N. Y.

New high-solids lacquer . . .



» LIKE ADD[illegible] SHIFT IN THE SPRAY ROOM



LIKE ADD[illegible] SHIFT IN THE SPRAY ROOM

It's just like adding extra operators in the spray room—with high-solids lacquers on the production line. Each coat can do the work of two. Thus operators can turn out more pieces per hour, assembly is speeded up, finished products more rapidly released for shipment. The secret is more solids and less solvent. The high-quality appearance and durability of high-solids lacquers is equivalent to that of older types, in coatings of equal thickness. Use high-solids lacquers for production finishes—and save!

ASK YOUR LACQUER SUPPLIER for details and application data on these new time-and-money-saving lacquers, as they become available. Hercules does not make high-solids lacquers, but concentrates on the production of the highest quality nitrocellulose from which they are made.

CL-55A

HERCULES

Cellulose Products Department

HERCULES POWDER COMPANY
INCORPORATED

928 Market St., Wilmington 99, Del.

APPROVED FOR ORGANIC VAPORS

The NEW M·S·A CHEMICAL CARTRIDGE RESPIRATOR

OFFICIALLY APPROVED BY THE U. S. BUREAU OF MINES

This new M.S.A. Respirator provides respiratory safety for industrial finishers against harmful paint spray vapors, degreasing solvents, paint removers, etc. New floating cushion facepiece assures easy comfort; flat exhalation valve lessens breathing resistance; chemical cartridges are quickly replaceable. Write for details!

MINE SAFETY APPLIANCES CO.
BRADDOCK, THOMAS AND MEADE STS.
PITTSBURGH 8, PA.
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RUST TAKES NO HOLIDAYS!

Even though your plant is shut down, *rust* stays on the job. When equipment or material must lie idle, whether for a short week end or a long lay-up, it needs the positive protection of Tectyl. Easily applied by spraying, dipping, brushing, or flushing—Tectyl is economical to use, on all metal surfaces against corrosion for as long as two years. The Tectyl thin film is transparent and comes off quick and clean with kerosene. There is a TECTYL product for *every* rust problem.

TECTYL
STOPS RUST
VALVOLINE OIL COMPANY
431 Main St., Dept. 24G, Cinn. 2, Ohio
Refinery at Butler, Pennsylvania
New York-Atlanta-Pittsburgh
Detroit-Chicago-Los Angeles
Vancouver-Washington, D.C.

have written the Cedarkote Products Co., 101 Park Ave., N. Y. C., but our letter has been returned as "not found".—N. P. Co.

We are not familiar with such a product. Can some reader tell us?

Of course, a material to spray into clothes closets and cedar chests to give the interiors a strong cedar odor, is made by Sparhawk Co., Sparkill, N. Y.—ED.

Masking Material

We are interested in some sort of material that can be used for masking off hardware, etc. We would like to apply this on our hinges, as they are mounted on cabinets in black. After mounting they pass through a vapor degreaser (trichlorethylene) then to prime coat. Here they bake at 300° F. for 30 minutes. After they have gone through this process we would like to be able to peel off the mask, leaving the polished chrome hinge bright and in good condition.

If you know of any firm or plant that makes such an article we would be very happy to get in contact with them. If you do not, would you please run this inquiry in your "Question and Answer" column of INDUSTRIAL FINISHING magazine, the old stand by?—C. S. MFG. CO.

In a letter we are submitting the names and addresses of some manufacturers of stop-off lacquers which may take care of your requirements. —ED.

S. S. Stenciling Machines Available

Referring to S. Mfg. Co.'s question about where to obtain a power-driven squeegee stenciling machine, as published on page 110 of June issue, I am pleased to name the following sources for this equipment:

Louft, 815 Third, N. W., Washington 1, D. C.

Geo. . Pembroke, 339 Lafayette St., New York 12, N. Y.—MARC. CORY.

Conical Mandrel for Testing Finishes

We have been studying the various testing procedures for determining flexibility, toughness, and adhesion of synthetic enamel and baked paint finishes. A number of manufacturers now use mandrels of various diameters over which specimens are bent. In this way, a minimum diameter of mandrel is determined on which the

(Continued on page 12)

PERFECTION FLAT FINISH
TRANSPARENT AS *Clear Glass*

REVEALS FULL BEAUTY
NO CONCEALMENT—NO DISTORTION

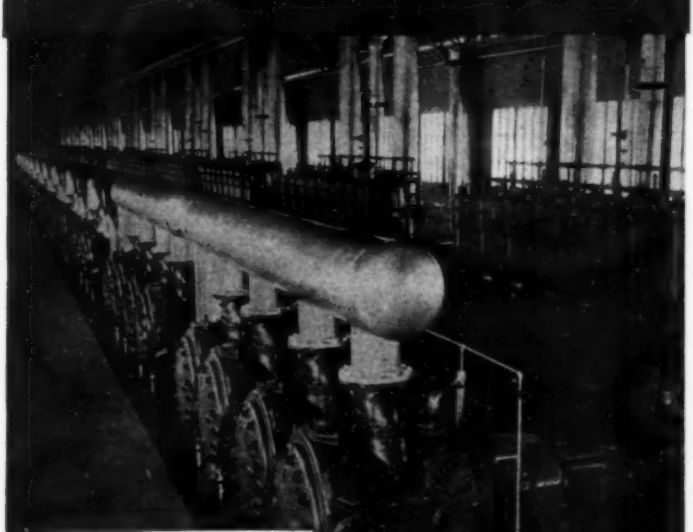
● Notice how the glass covered with conventional flat finish (gloss varnish with stearates or other foreign flattening agents) masks and distorts the beautiful girl in the picture. This same degree of concealment and distortion occurs when ordinary flat finishes are applied to furniture surfaces.

What a difference when Perfection Flat Finish is applied! A unique product of synthetic chemistry—perfectly clear, free of distortion—Perfection Flat Finish brings out the utmost beauty of wood grain and stain.

Waterproof, liquor-proof—free from orange peel—durable and economical—Perfection is best by every test. Let Perfection Flat Finish prove its outstanding superiority—right in your own plant. Perfection Flat Finishes are available in a full range of long-lasting sheens.

PERFECTION
PAINT & COLOR COMPANY
Indianapolis, Indiana

Celanese* Chemicals



Battery of compressors in the new Celanese synthetic chemical plant at Chemcel, near Bishop, Texas, where some of the units are already beginning operation.

CELANESE CORPORATION OF AMERICA

Greater access to the major source of Synthetics

CELANESE RESEARCH has increasingly specialized in the synthesis of hydrocarbons. This research has resulted in the creation of new chemical compounds which in addition to serving the present war effort promise important contributions to peacetime industrial processes.

In line with this program is the new Celanese Chemical plant in Texas, some units of which are already in production. Close to major sources of petroleum and natural gas, this new plant will substantially increase the scope of Celanese chemical operations. Production will include important basic chemicals such as acetaldehyde, acetone, formaldehyde and methanol, for conversion into specialized compounds used in a wide range of industrial products—synthetic plastics, lacquers, dyes, textiles, resins, adhesives, preservatives, essential oils, solvents, soaps, drugs, lubricants, antiseptics, anti-freeze, synthetic rubber.

The scope of Celanese research will keep pace with expanded production—its guiding concept applied to a still broader field: The constant effort to create new materials exactly suited to specific needs, rather than adapting needs to existing materials.

An example of this approach is the Lindol* series of organic phosphates, compounds that serve many industrial demands with versatility as well as precision.

Celanese invites inquiries concerning synthetic chemicals and particularly welcomes inquiries in terms of specific objectives.

Celanese Chemical Corporation, *a division of Celanese Corporation of America,* 180 Madison Avenue, New York 16, New York.

*Reg. U. S. Pat. Off.

TEXTILES • PLASTICS • CHEMICALS

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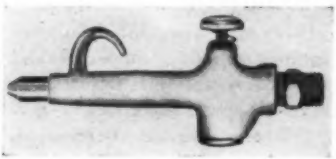
Available Again!

BALLOU'S
Imitation Chrome Aluminum Paste

Also other grades of Aluminum Powders and Pastes ranging from 170 to 325 mesh. No allotment or priority required.

Send for sample and prices

EDWARD C. BALLOU CO.
6 Varick Street
New York 13, N. Y.



Leakproof Air Blow Gun

Use this gun for blowing dust, dirt or lint from the surfaces of parts and products to be coated with paint or any other kind of coating. It will improve your finish tremendously.

Also useful for blowing out moisture or other entrapped liquid from crevices, seams or indentations in parts to be cleaned or painted.

Fits comfortably in the palm of hand. Has button control air valve. Special composition washers prevent leakage. We can furnish any type nozzles—round, pointed, flat or 10-in. extension. Nozzles are interchangeable and renewable. Every plant should have one or more. Write us!

G. M. MANUFACTURING CO.
Engineers, Mfrs. of Complete Spray Equipment
216 N. Clinton St. Chicago, Ill.

specimen will withstand bending without fracture of the finished surface.

Recently we were informed of conical-mandrel testing equipment which seems as though it ought to determine flexibility, toughness, and adhesion without the use of so many mandrels of different sizes.

We are eager to get whatever information we can regarding the test procedure for the conical mandrel instrument, and an indication of the results obtained by any users of this equipment. We are especially interested in knowing the nomenclature that is used in indicating the results of a conical mandrel test.

We believe that the conical mandrel for testing flexibility of coatings, etc., is a product of Henry Zuhr, 137 Lafayette St., New York, N. Y.

Detailed information about testing procedure of various kinds can be secured from paint laboratory technicians, independent testing laboratories, and from manufacturers of various kinds of testing equipment.—ED.

Mist from Spray Booths

We would like to have all possible information relative to paint spray booths. We are small manufacturers of water heaters and have for the past 20 years used a simple dry spray booth with an 18-in. exhaust to the outside. This booth is 3-ft. wide, 4-ft. deep and 7-ft. high, which is ample for spraying the outer shells of our product.

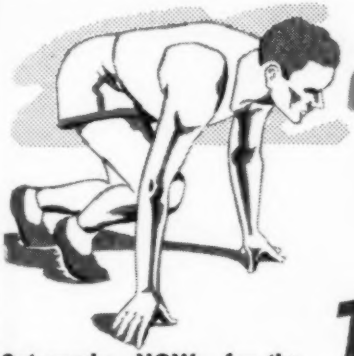
We desire to eliminate or greatly reduce the spray mist from the exhaust. The water spray booths are too large and expensive for our present needs and we feel sure there must be a smaller and less expensive booth manufactured, so trust that you may be able to advise us. Possibly a well designed dry-filtered booth would be satisfactory.—I. HEATER CO.

One of the air filter companies has filters for installation in spray booths. The filters are supposed to catch and retain the particles of paint in exhaust spray mist. In a letter we are submitting the company's name and address.—ED.

Factory Layouts Are Our Specialty

We note the inquiry from a reader, "M. W. Co.," under "Letters from Readers," in the April 1945 issue of INDUSTRIAL FINISHING, for an engineering firm to work out a plant layout. The engineering of factory layouts is a principal function of the Production Engineering Divn., of De-

(Continued on page 128)



GET READY GET SET TO GO!

Get ready—NOW—for the race to meet heavy post-war demands and keener competition. If yours is a problem of getting a better finish . . . quicker, and at lower cost . . . then by all means get the facts about

Controlled Humidity FORCED DRYING

ENGINEERED BY KOCH

In some cases KOCH Forced Drying Equipment has more than doubled production . . . cut the cost-per-finished piece . . . eliminated rejects . . and paid for itself in material savings alone!

You may have less time than you think . . . Find out, NOW, what KOCH Forced Drying Equipment can do for YOU.

GET ALL THE FACTS! SEND FOR BULLETIN A-230.

GEORGE **KOCH** SONS, INC.
INDUSTRIAL EQUIPMENT
EVANSVILLE 4, INDIANA

PHONE, WIRE OR WRITE KOCH TODAY!

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suggests—

KERATYN

NEW · LOW BAKE · QUICK BAKE

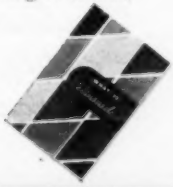
PORCELAIN LIKE FINISH
NO DISCOLORATION
CLEAR AND IN ANY COLOR
ANY DEGREE OF GLOSS

A. C. HORN COMPANY
PRODUCTS FINISHING DIVISION
LONG ISLAND CITY 1, NEW YORK
CHICAGO • HOUSTON • LOS ANGELES

COAT THE BASES OF SMOKERS' ACCESSORIES with

Cellusuede FLOCK

There's no chance of marring desk or table tops if smokers' accessories, such as the tobacco humidor and pipe stand illustrated above, have bases that are coated with Cellusuede Flock. In addition, the velvety or suede effect greatly enriches the appearance of any product, and the wide range of brilliant colors gives opportunity for matching or contrasting color schemes. Economical, easy-to-apply Cellusuede is available in both Cotton or Rayon flock. No rationing . . . no priorities . . . no delay.



Send today for Samples, Prices and Booklet explaining what Cellusuede is and how it is used.

CP *Cellusuede Products, Inc.*

ROCKFORD, ILLINOIS

SHELLAC
LACQUERS
SEALERS
STAINS • GLAZES
UNDERCOATS
ENAMELS
• NOVELTY FINISHES •

IN STEP WITH THE TIMES

Industrial Finishes
that make the most of available raw materials to give you greatest durability, together with attractive appearance and economy.

• FOR APPLICATION BY ALL METHODS

JAMES B. DAY & CO., CHICAGO

17 REASONS WHY IT'S DIFFERENT

AND EVERY REASON IS INDICATED BY OUR PATENT CLAIMS ON THIS DESIGN

PENETRAY

Reduced glare is an important reason for your selection of a Specific Near Infra-red source. Next, for baking, drying and evaporating, a radiant source peaking between 13,000 and 14,000 Angstrom Units is most desirable. These are two definite reasons for your use of Penetray.

Penetray production is unusually costly because of filament and construction detail. This, in our opinion, is necessary to a quality product. Lamp life and efficiency is improved - resistance to vibration being maximum. A nonex arbor protects against softening of glass and resulting distortion of filament due to sagging. Radiant energy is emitted in both the vertical and horizontal.

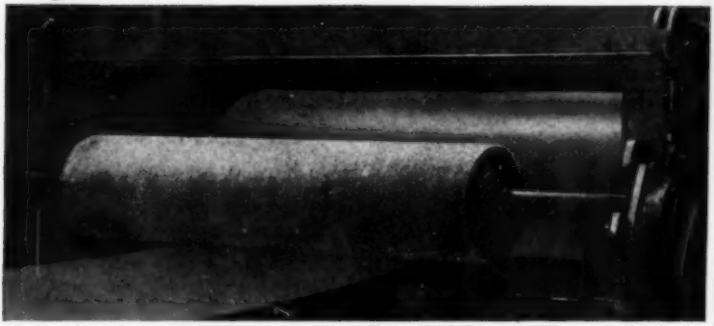
Honestly, now, don't you want to know more about this new product and the prospect of improved results?

INFORMATION ON REQUEST - WITHOUT OBLIGATION

LEARN TO SAY »PENETRAY«

VERD-A-RAY CORPORATION • TOLEDO 5, OHIO

BRUSHES



● *Consult with our engineering representatives. They will gladly work with you in developing "Even Trim" Spiral Wound Brushes, of wire, horsehair or tampico, to meet your particular finishing requirements.*

INDUSTRIAL BRUSHES of all Types For BETTER PRODUCTION

PERFECT BALANCE

Carefully controlled distribution of the brushing stock gives perfect balance and maximum efficiency to these power driven rotary brushes. Wire or fiber. May be used as individual sections or in assemblies.

UNI-FILL

These scratch brushes are uniformly filled. They are trimmed with a "bite" to give the best performance obtainable with hand scratch brushes.

RED CENTER

Red Center Wheel brushes, now available, are made in various diameters and degrees of stiffness for many different applications. They are sturdy in construction and in perfect balance.

PITTSBURGH
PLATE GLASS COMPANY
Brush Division
3221 Frederick Avenue - BALTIMORE 29 - MD.

It's here! An enamel formulated to resist EXCESSIVE HUMIDITY

• Exhaustive tests have proved excessive humidity softens and blisters enamel product finishes—causes the finish to lift and expose the metal to rusting.

But now there's an enamel safe from this danger! It's the new White Nubelite, especially formulated by Glidden to resist excessive humidity.

This top quality enamel also has extra resistance to heat, to grease films deposited by oven fumes, to salt vapors carried in the air in states bordering on salt water.

This new Nubelite is an ideal finish for metal cabinets, household appliances, including stoves, and refrigerators . . . and many other products. Available NOW! *Write us for complete details!*

THE GLIDDEN COMPANY · Cleveland 2, Ohio

TIME-TESTED

GLIDDEN · *Pacemaker in Paints*

BEHLEN'S ANILINE STAINS

SINCE 1888

COLOR-CONSISTENCY

Professional craftsmen and industrial manufacturers know the importance of color-consistency and for uniform quality production, their stains must also be uniform quality. Since 1888 Behlen's ◈ Aniline Stains have gained the reputation of uniform quality and color consistency. Behlen's have the largest up-to-date selection of color-correct aniline stains.

WATER SOLUBLE STAINS

When the raised grain effect, accentuated figure and brilliant highlights are specified, use Behlen's ◈ Water Soluble Aniline Stains. They do not fade or change color when used exteriorly. They readily dissolve in boiling water.

ALCOHOL SOLUBLE STAINS

Many professional craftsmen and industrial manufacturers prefer Alcohol Soluble Stains. Sometimes the kind of wood, the type of finish, may best be achieved by the use of Alcohol Soluble Stains. Behlen's ◈Alcohol Soluble Stains will give the nature-true color and grain accentuations, craftsmen want.

OIL SOLUBLE STAINS

Behlen's ◈ Oil Soluble Stains are precision-made by aniline experts, to give an even application, desired by professional craftsmen. Wood accentuation, deep penetration and wood color harmony of Behlen's ◈ Oil Soluble Stains have long been well known to the Piano, Furniture and Hardwood Finishing trade.

Behlen's will match any color for the wood finishing trade. Behlen's also manufacture stains in liquid form, ready for use.

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H. BEHLEN & BRO., Inc.
10 Christopher Street
New York 14, N. Y.
Please send, without obligation, Behlen's Aniline Stain List and Behlen's Aniline Stain Color Card.

Name.....

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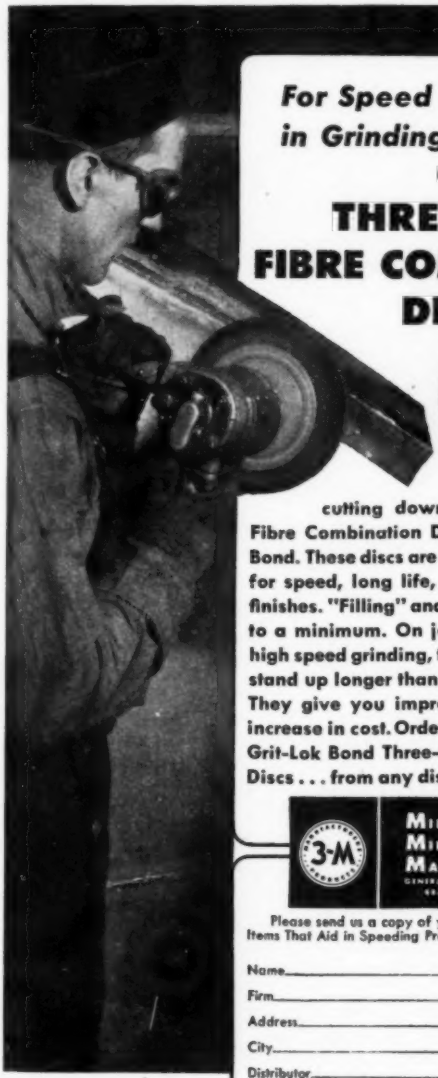

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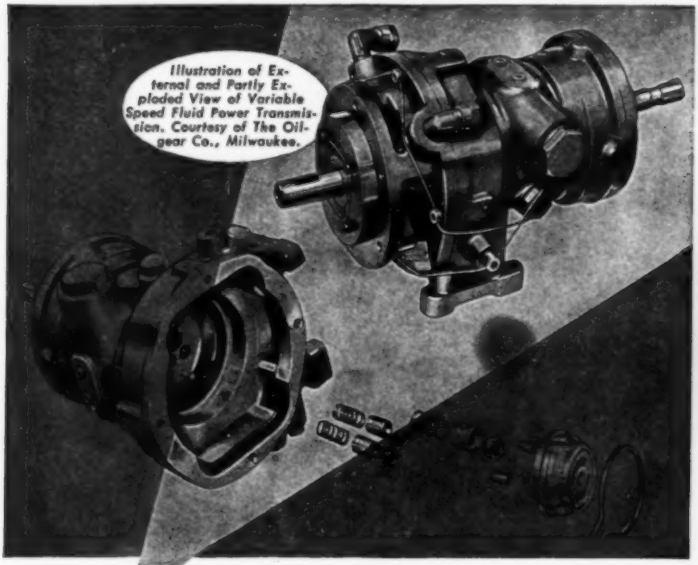
Illustration of External and Partly Exploded View of Variable Speed Fluid Power Transmission. Courtesy of The Oilgear Co., Milwaukee.

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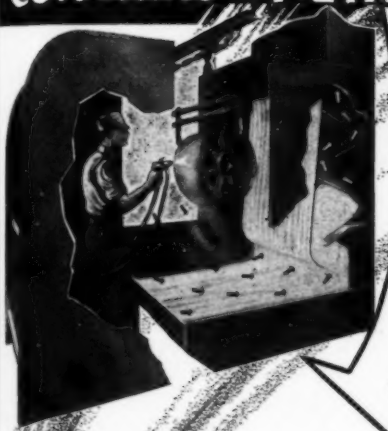

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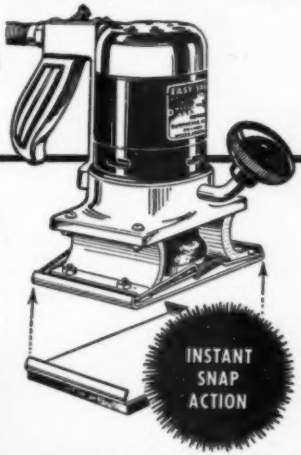

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Trick fi

Some novel and decorative finishes that can be utilized to give strikingly attractive effects to a number of your postwar civilian products.

BY S. P. WILSON

IN THE competitive pre-war period, a variety of finishes were developed to catch consumers' eyes. Some of these had functional advantages such as giving a texture finish that hides surface roughness and imperfections; others had mere eye appeal, gained either through intrinsic beauty or the novelty of the effect.

During the last five years there has been little place for these finishes, with the exception of certain dull wrinkles that have military value. To the new generation of finishers, purchasers and designers, many of these effects are either total strangers or merely a vague memory. It might be well to recapitulate, for possible future use, some of these unusual effects.

Wrinkle Finishes in Many Different Patterns

The wrinkle finish hardly comes into this class, since its use has been maintained all during the war period. In this product the oil, resin and drier ingredients are so balanced that when dried, usually by baking, the surface is ridged or wrinkled instead of being smooth.

finishes

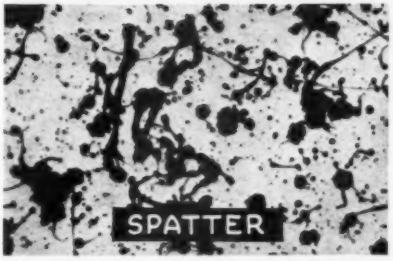
The original formulations were based on the use of tung oil which, in the writer's belief, is still the best basic ingredient. However, owing to the high cost and scarcity of this commodity, many other combinations have been made; some of them are surprisingly good; others are somewhat irregular and disappointing.

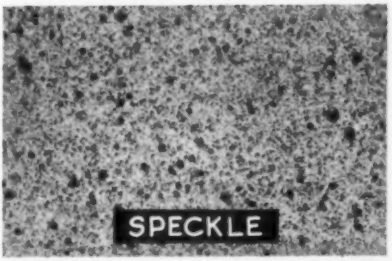
Advantages of this finish include easy obscuration of surface defects, an attractive texture, and good durability when properly compounded. The chief objection is the tendency of the wrinkled surface to gather and hold dust and dirt.

Crystal Bake Finishes and Crystallizing Lacquers

Crystal finishes fall into two entirely different categories. The original crystal finish was, like wrinkle, a spoiled enamel also based on tung oil but not gasproofed. When baked in a foul oven—one where the fumes of combustion are in contact with the drying object—a surface of small irregular crystals was obtained. It was quite popular for electrical and laboratory equipment and similar articles.

Crystal lacquers, popular for a brief period 10 or 15 years ago, were entirely different. Here an actual organic crystalline material was dissolved in a nitrocellulose or ethylcellulose solution whose solvents were so proportioned that the substance crystallized, on drying, into a variety of most beautiful effects. Some of the results on smooth clean metals could not be





duplicated by the most expert engravers. The best results were based on a one-coat finish, as it was found very difficult to supply either ground coats or topcoats inert enough to permit the full development of the crystal beauty.

A large number of metal caskets were finished in this effect, some of them really magnificent works of art. It was found that best results were obtained when the surfaces were clean and very smooth, and with the lacquered article kept in a room free from dust or air currents, and preferably around 85°F. There will be many places where this type of finish will again serve a useful decorative purpose when civilian manufacture is resumed.

Crackle Finishes of Lacquer Offer Variety

Crackle finish is another oldtimer whose technique is rarely learned and whose name has been confused with the wrinkle finishes previously mentioned. Crackle is a lacquer type finish, usually requiring three coats. It gives a variety of attractive effects ranging from a close resemblance to alligator leather, to a very fine-cracked texture.

Crackle lacquer is usually an overpigmented material which, when dried over a lacquer undercoat, pulls apart and shows the undercoat color as lines separating the areas of the crackle color itself. A thin coat of crackle gives fine lines and small areas; a heavy coat gives large irregular areas separated by heavy lines. Obviously, to get uniform results, careful spraying is needed as well as rigid control of the concentration and visvosity of the lacquer. The undercoat can be of any color, and it can also serve as a primer.

Since the layer of crackle is somewhat loosely attached to the undercoat and could be easily rubbed off, the usual practice is to apply a coat of clear lacquer, gloss or flat as desired, as a finish coat. A variation on this would be to use a colored lacquer as the finish coat. This would give a monochrome effect instead of the contrasted colors of the previously mentioned system. Here the structure would be retained, but only one color would be observed.

Somewhat remotely akin to crackle is another finish that is used occasionally, particularly on wood furniture. I know of no name for it, but it is designed to give the appearance of aged, cracked varnish. This system is based on a quick-setting oil or alkyd enamel ground coat, to which, just about as it is reaching the settling-point, a coat of glue in warm water is applied. As the glue dries, it contracts and literally cracks the undercoat. A contrasting color can then be rubbed into the cracks; the glue is removed by hot water and a flat varnish finish coat is applied. Properly done, applied and treated, this finish is far more attractive than its bare description would indicate and I believe that it will appear regularly on card tables, occasional tables and other wood articles where it will give the desired novelty decorative effect.

Veiling and Webbing Lacquers

Veiling or webbing lacquers have found occasional use in the past, and they will likely appear again in the future postwar period. Here advantage is taken of the property of solutions of rubber and certain synthetics of coming out of the spray gun in cobwebby threads. When these colored threads are sprayed skillfully over a suitable

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Technical Service Data Sheets on DEOXIDINE sent on request to Department B-7.

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ground coat an attractive effect, once widely used for vending machines, advertising novelties and similar articles, can be obtained. Operator skill is necessary here, and since these lacquers are sprayed at high viscosity a special nozzle is needed on the spray gun.

Hammered Effects as a Decorative Finish

The hammered or dimpled effects form another group in the trick-finish family. The base is usually a quick-drying synthetic enamel containing a small percentage of a special bronze powder. As soon as this coating has been applied, more of it is sprayed on at low pressures, through a special nozzle with a volatile solvent. This strikes the surface as individual drops and evaporates quickly, leaving the optical appearance of a hammered metal surface. The finish may be baked if desired, or it can be formulated to air-dry. A similar effect can be obtained with lacquer, but it is not as pronounced. Here again operator skill is important, but when everything is done correctly, from the making of the finish to the final application, a very beautiful effect is obtained that will certainly find many fields of usefulness.

Pearl Essence Finish and Opalescent or Metalescent

The pearl or nacreous effects are invariably air-dried and based on lacquers. The active ingredient is the pearl essence which is laboriously removed from the scales of certain fish. The final step in this process incorporates these crystals into a lacquer paste that mixes freely with other lacquer. A clear lacquer into which this essence has been mixed gives a beautiful nacreous effect — in fact, artificial pearls are produced by carefully coating glass beads with multiple coats of this type of lacquer.

By mixing the essence with enamels, pearly effects are also obtained; that is, a mixture of essence and black lacquer gives a superlatively beautiful gunmetal or black pearly surface. Although pearl essence is necessarily expensive, there is every reason to expect a growing use of its power to beautify, especially on small curved surfaces and polished metals, glass or plastics. Some lead, bismuth and mercury salts give results simulating the pearl essence, but they have certain health hazards, corrosive effects on spray equipment and, being heavy metal salts, they have much more tendency to settle out.

The industrial designer is urged to keep these trick finishes in mind for postwar developments. Their potential value is not exclusively as an all-over finish for a given article, but many of them can be used as accentuation of conventional finishes by application to comparatively small areas. Properly compounded and intelligently applied, the choice of wrinkle or crackle, crystal or cobweb, pearl or hammered effect, can enable novelty and beauty to be incorporated into articles for the mass market and satisfy the basic, instinctive demand of the potential purchaser for "something different." Don't overlook the trick finishes.

Editor's Note: In addition to the several trick, novelty and decorative finishes mentioned in the foregoing article, a few others include speckle, spatter, marbleized and a clouded-sky effects. Some of these are shown in this article.

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PERMITE READY MIXED ALUMINUM PAINTS

Cleaning of Metals for Production Painting

BY RAY SANDERS

Vice President—General Manager
Turco Products, Inc.

THE EFFECTIVE preparation of metal surfaces for painting has always been a problem to finishers. During the past five years the pressure of war has brought so much new research and experience to bear on the solution of this problem, that a review of what has been learned should be helpful in charting paths ahead.

Cleaning plays a vital part in production painting and finishing. When the surface is coated with grease, oil, dirt or other foreign matter adhesion of paint cannot take place. For this reason it is necessary to remove grease, oil, dirt, metal chips, rust, scale and other foreign matter in order that a smooth, tightly adherent, paint job can be obtained.

Material Must be "Tailored" To Fit Specific Job

Experience and research have established the fact that there is no one cleaning method or material that will satisfy all conditions. A cleaning method is uniformly effective only if it is tailored to remove a particular kind of dirt from a particular kind of metal, under a given set of conditions. These conditions include the quality of painting or finishing job that is required, the time and equipment available for cleaning, and the amount of manpower that can be utilized. Never to be overlooked is the nature of the water used in making up the cleaning solution, since this may have a profound influence on the effectiveness of the cleaning.

The attack on one of the product painter's chief enemies, dirt, has lead to the develepment of a new science—"surface chemistry." Like every other science, surface chemistry is based on certain fundamental principles. It is based, first of all, on a knowledge of dirt, its composition and its behavior. Secondly, it is based on a knowledge of and mobilization of chemical and physical factors which must be brought into play to get rid of dirt. A knowledge of these factors should prove to be of great value to finishers by providing them with standards which will help them in their selection of a suitable cleaning compound.

What It Takes to Remove Oily Dirt

Oil is what makes dirt stick to a surface. Practically all dirt is surrounded by an adhesive oily film. To get rid of the dirt, the grip between the oil and the surface must be broken. The first step is to get the dirt wet but, as we all know, water will refuse to wet an oily surface. However, scientists have learned how to make water wetter. Certain chemicals can be added to water which not only enable it to spread out over an oily surface but to get down under the oil, so that the oil is separated from the surface by a thin

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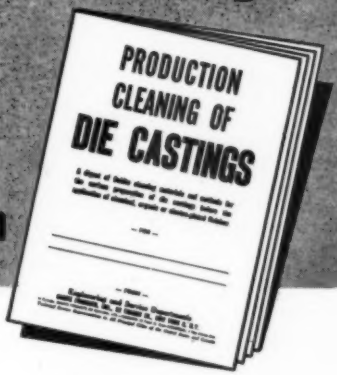

DIE CASTINGS that are to receive organic, chemical or plated finishes for protective purposes or sales appeal must be FIRST thoroughly cleaned. This newly-published Oakite Digest, "Production Cleaning of Die Castings" gives you valuable data on low-cost surface preparation methods based on the successful experience of hundreds of producers and users of die castings.

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film of cleaning solution. Rapid, thorough wetting makes it possible for the cleaning solution to come to grips with dirt.

Emulsifying Action

Wetting action weakens the bond between oil and surface, but is unable to dislodge an oily mass. After wetting takes place, emlusifying action comes into play. Emulsifying agents have the ability to break up continuous layers of oil into small globules, and to scatter and suspend these droplets through the cleaning solution so that they cannot be redeposited. The combined effect of wetting and emulsifying actions is the loosening, breaking up, and dispersion of oily films.

Saponifying Action

We all know that oil is not soluble in water. However, through chemical action, certain oily constituents of dirt can be made soluble in water. These substances are known as fatty acids, present in most animal and vegetable oils. Certain alkalis have the ability to combine chemically with these fatty acids to form soap and glycerine and, as we all know, these are soluble to water. You can't see the soap formed in this manner, but it is there—and a remarkable thing happens. The dissolved soap (remember that it was originally part of the dirt) increases the emulsifying and wetting power of the cleaning solution. Thereby the removal of that part of the dirt which cannot be saponified (changed into soap) is greatly speeded. A portion of the dirt is made to turn against itself and to help in its own removal.

Dirt is a miscellany of solid particles of various types held in position by an oily film. Emulsifying and saponifying actions help in the removal of grease and oil, but all scientifically formulated cleaners provide for the breaking up and dispersion of solid particles as well. This is accomplished through colloidal action. Cleaning agents can be formulated which have the ability to break up a solid mass into small particles and to scatter them through the cleaning solution so that they will not settle out. Carbon, clay, road film, dust, food particles, and paint are among the forms of dirt removed with the help of colloidal action.

Solvent Action

When a solid, such as table salt, dissolves in water it is broken down into particles so small that they are invisible, even under the electron miscroscope. These particles are uniformly distributed throughout the water. They show no tendency to settle with standing, and they cannot be filtered out.

Water itself can remove very few types of dirt through direct solvent action, since water has no tendency to dissolve oils, fats, resins, tar, rubber, plastics and many other substances which represent the most troublesome types of dirt. However, science has developed remarkable solvents, and mixtures of solvents which are capable of cleaning parts which would have been discarded as hopelessly fouled only a few years ago. Hard baked carbon, baked enamel, tough engine varnish, very heavy greases yield almost magically to these scientific solvents, which have the further advantage of being almost neutral chemically so that they offer an avenue for the safe cleaning of easily corroded metals, such as aluminum, magnesium, copper, zinc, and others.

The symbol, pH, is a yardstick for measuring the degree of alkalinity or acidity of water solu-

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tions. It is a measure of the energy, but not of the amount of alkali or acid in the solution. pH alone does not clean, since the cleaning ability of a compound is not to be measured by its alkaline or acid strength.

Two solutions may register identical pH values on the most sensitive instruments known, yet one will corrode aluminum, and one will not; one will remove paint and primer swiftly and completely, while one will leave them unaffected; one will maintain its efficiency for weeks or months, one only for hours or minutes.

Measurement of pH is valuable in supplying comparative information about the action of a particular cleaner, under a fixed set of conditions, and in establishing general values in which certain types of cleaning can be expected to take place. It takes its place as one among a number of factors which must be considered in formulating a scientific cleaning compound.

Buffer Index

A carefully formulated alkaline or acid cleaner is buffered so that its cleaning energy will not be rapidly exhausted by the dirt which it removes. As the energy of acidity or alkalinity is used up in cleaning, a fresh supply is liberated to sustain the cleaning efficiency of the solution. The long life of the cleaning solution, the amount of maintenance it requires to keep it up to par, and the uniformity of the results it produces are largely dependent on buffering.

Total Alkalinity or Acidity

In the selection of a cleaning material, the criterion of value is not the amount of acid or alkali by weight or volume which is offered, but the extent to which these substances play an active part in the removal of dirt. If a considerable part of the alkali or acid in a cleaning compound fails to yield active cleaning energy, it represents so much inert matter or filler.

In the formula of a scientifically balanced cleaner a definite function is assigned to each component; there is a definite reason for the inclusion of each ingredient. The elements in the formula will not merely fulfill their own functions, but will mutually support and reinforce each other, so that the whole will be more active and more stable in cleaning than any of the parts.

Water Conditioning

Hard water is an ever present problem in cleaning and other industrial operations. Hard water is responsible for film on glasses and dishes; hard water is responsible for scale in boilers and cooling systems, for the ring around the bath tub, and for that dull murky coloring in laundered textiles.

Modern cleaning agents are formulated to condition hard water, to control the minerals responsible for water hardness so that they cannot leave the solution, interfere with the cleaning action, or form scale and film deposits. Chemistry has developed remarkable materials for the treatment of industrial water supplies, which not only prevent scale from forming but remove existing scale.

Any cleaning material used with water should be formulated so that it can be used successfully and economically in the hardest water.

We have been able to present only the highlights of the principles of surface chemistry as applied to product cleaning. The practical application of these principles has already resulted in spec-

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tacular savings in time, in labor, in money and—equally important in the conservation of irreplaceable equipment. Yet this is only a beginning. Researches now under way point to further developments which will even further simplify the maintenance of effective metal cleaning equipment. Surface chemistry is a new and expanding field in which science operates in the service of modern industry.

Wire Brushing Small Metal Parts

CLEANING and removing the burrs on small metal parts effectively and economically is often something of a problem, especially if the work is specified to be performed by wire brushing.

Two shop-made holding fixtures that provide power brushing with a new and effective means for fast output, were recently reported to The Osborn Mfg. Co. of Cleveland, manufacturer of power brushes.

One is a hand-made pair of forceps for holding tiny splines

Fig. 1—Holding small metal parts with shop-made forceps. Photo, courtesy The Osborn Mfg. Co.

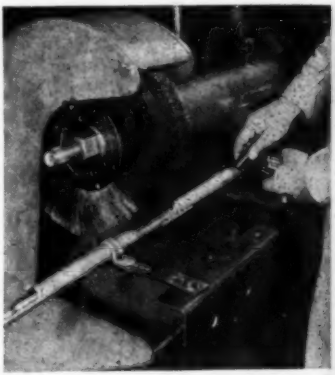


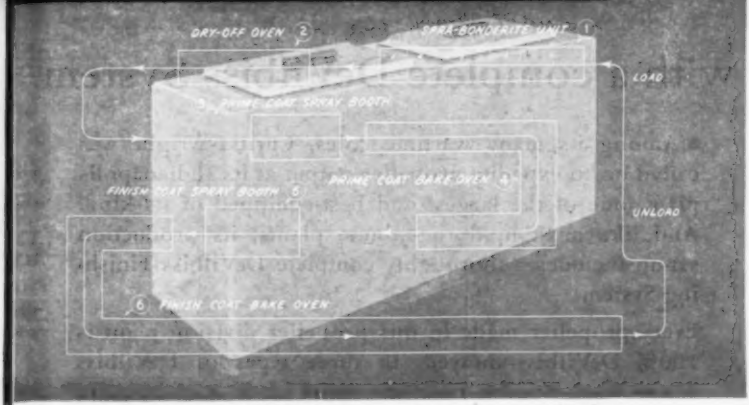
Fig. 2—Adopting the "gas pipe" to an engineered idea of holding parts for brushing. Photo, Osborn Mfg. Co.

against a brushing wheel for removal of burrs and other surface irregularities (see Fig. 1). The use of different sized holding heads makes this idea applicable to various sizes and shapes of parts to be brushed.

The other idea is for stepping up production in power-brushing threaded studs. This holding fixture employs the "gas pipe" idea (see Fig. 2) which is both novel and scientific. The pipe is placed at a level which enables it to employ gravity as an aid in the feeding. Opposing the gravity is a small fixed brush which extends through the pipe opposite the rotating brush. When the threaded stud reaches this opening and comes in contact with the power brush, it also engages the small side brush. Since the power brush rotates the threaded part, it follows the course of the threads from one end to the other and controls the time that the part is in contact with the wire brushing surface.

(Continued on page 42)

Another complete Finishing System . . . by Despatch



—for processing 200 Home Freezers daily!

A glance at this layout—of a new finishing system just installed by Despatch—at once reveals benefits obtainable when *experienced* engineers handle the entire job from A to Z.

The space-saving layout . . . the planning of the conveyor-route . . . the arrangement of bake ovens . . . the obvious unity of the different elements—these are just a few of the things you get when Despatch engineering specialists handle *all* details of your finishing system installation.

LET DESPATCH SUPPLY YOUR SYSTEM

For efficient, sure results in finishing, ask Despatch engineers to plan and install the equipment you need.

Send this coupon for full details.

All of the equipment for this new Finishing Department was planned, selected and installed by Despatch engineers.

1. **SPRA-BONDERITE UNIT**—A 5-stage unit.
2. **DRY-OFF OVEN**
3. **PRIME COAT SPRAY BOOTH**—Water-wash type.
4. **PRIME COAT BAKE OVEN**—*Despatch* forced-convection direct gas-fired oven. Approx. length 150 ft.
5. **FINISH COAT SPRAY BOOTH**—Water-wash; 18 ft. long.
6. **FINISH COAT BAKE OVEN**—*Despatch* direct gas-fired oven; approximate length 225 ft.

Note: Work stays on same monorail conveyor; eliminates manual handling.

DESPATCH OVEN COMPANY
619 SE 8th Street, Minneapolis 14, Minn.

☐ Send more details about Despatch's engineering service in supplying Finishing System equipment.

☐ Please survey our plant without obligation and recommend new equipment for our Finishing Department.

NAME_____

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DESPATCH
OVEN COMPANY MINNEAPOLIS 14 MINNESOTA, U.S.A.

Curtiss-Wright "REVS UP"

Propeller Painting

with a complete DeVilbiss System

● Among its many wartime roles, Curtiss-Wright was called on to expedite propeller output at its Indianapolis plant, one of the largest and best-equipped of its kind. And like most up-to-the-minute plants, its production set-up includes a thoroughly complete DeVilbiss Finishing System.

Every propeller made in this propeller division plant is 100% DeVilbiss-sprayed, in three types of DeVilbiss Water-Wash Booths. First, the entire blade is given paint protection. Then, tips are spray-painted and at another DeVilbiss spray station, propeller accessory housings are spray-coated.

Then, for top finishing speed and uniformly-high finishing quality, Curtiss-Wright has a DeVilbiss Paint Circulating System that distributes all spray materials from a central mixing room to each spray station.

Here's a preview of some modern finishing line ideas that may be adapted to your present or future plans. A DeVilbiss engineer will be glad to bring you complete information.

THE DeVILBISS COMPANY • TOLEDO 1, OHIO

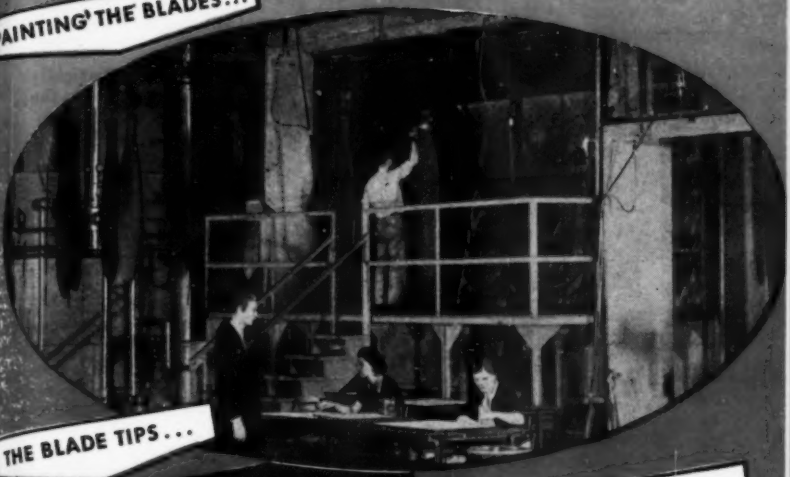
Canadian Plant: Windsor, Ontario

DE VILBISS

Spray Systems

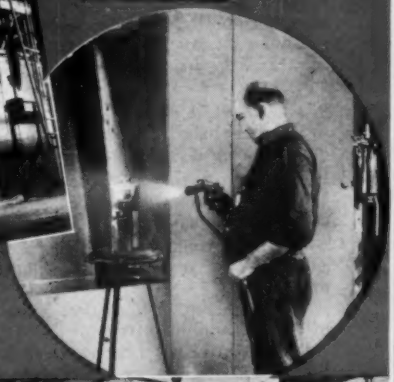
SPRAY EQUIPMENT • EXHAUST SYSTEMS
AIR COMPRESSORS • HOSE AND CONNECTIONS

PAINTING THE BLADES...

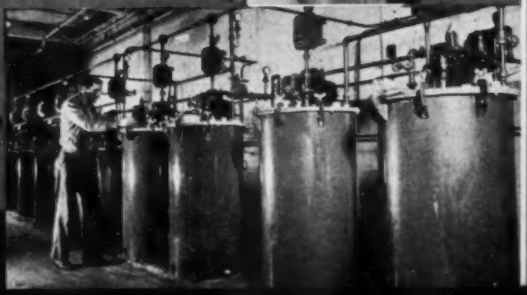


THE BLADE TIPS...

AND PROPELLER ACCESSORY HOUSINGS



WITH PAINT CIRCULATED BY THIS DEVILBISS EQUIPMENT



If the parts being brushed were made of soft material, the pipe fixture could be of plastic or other composition. This would prevent any possibility of damage to the external threads as they pass through.

Colors You Like Are Classified

A ST. LOUIS department store, is promoting "Quanta Color" which it describes as "the answer to the why and wherefore puzzle of color harmony in home furnishings; an unlimited guide toward deciding correctly what goes with what; the soundest plan yet for planning and carrying out a room scheme." One report explains the new development as follows:

"What quanta color really does is arrange the spectrum of colors into four unlimited color groups—groups containing the many variations of the primary colors as nature interprets them at four times of the day. There is:

"1) The bright; aggressive, radiant colors of early morning sunlight.

"2) The vibrant, dry, sharp colors of the noonday light.

"3) The cool, sparkling, airy colors of the waning light of late afternoon.

"4) The deep, rich, mellow colors of sunset and its afterglow.

"There are only four color families, and the colors of flowers, fruit, birds, stones and all nature fall into one of these four families, or quantas. Each quanta contains all the usual colors, varying as they occur at different times of the day.

"It is the theory that each individual has a strong preference for the colors and qualities of one quanta. Now one is automatically drawn to a certain quanta by the presence of those colors that appeal to him. While preferring a certain quanta, the colors of the other three groups are not necessarily distasteful to him, but he automatically chooses those colors in his own quanta in preference to any others."

In the St. Louis store's furniture department there are four model rooms, each illustrative of one of the four quantas. The first, quanta 1, is a bedroom, done in bright and aggressive colors — robin's egg blue, orange and strawberry. The furniture is compact and baroque. Quanta 2 is a bedroom done in sharp, vibrant noonday colors—red, white and lilac. Quanta 3 is a living room done in cool, clear afternoon colors—green, carrot orange, yellow. The furniture is light and delicate. Quanta 4 is another living room in sunset colors—rich, sombre and heavy. The furniture in this room is rich and heavy.—*National P, V & L Association.*

Metal Cleaning Service Schools

Representatives of the J. B. Ford Division of Wyandotte Chemicals Corp., Wyandotte, Mich., have been attending sectional meetings at which they are studying and rechecking their service methods. Each Wyandotte representative spends several hours under the direction of home office tcehnical service executives performing the same testing operations that he uses in plants on service calls.

These "Wyandotte sales schools" have been held at several different points in the United States and Canada. Better and more practical service to Wyandotte customers result from these extensive educational efforts.

Wyandotte representatives, for nearly 50 years, have had ready entrance to plants doing commercial cleaning and washing, because their ideas, methods, and products have been helpful. To keep Wyandotte Service for customers practical and scientific has been the reason for holding the recent "sales schools."

All Competent Spray Authorities Say:— "Use the Lowest Possible Air Pressure!"

If you want to get the best results from spray-painting, follow the advice of impartial experts. To benefit from their experience choose Eclipse Low-Pressure equipment, which operates at pressures from 15 to 50% less than most equipment.

Eclipse has specialized in Low-Pressure equipment for more than 35 years. Accumulated experience is yours for the asking through the free advisory service of Eclipse Engineers. Your nearest Eclipse engineer will be glad to help you. Tell us the nature of your finishing problem and we'll have an engineer call.

ECLIPSE AIR BRUSH COMPANY
392 Park Ave. • Newark 7, N. J.

ECLIPSE

QUALITY CONTROL THROUGH *Production Records*

The system one company uses to provide an accurate record of the quantity and kind of parts that are put through on each order, the strength and temperature of metal cleaning solutions used, all facts about paint materials applied, oven baking time and temperatures, and the names of workers who were in charge of operations.

BY WILLIAM W. LOMAN

IN THE finishing department of a large midwestern aircraft plant, much effort has been made to not only keep the production personnel quality conscious, but to make the quality control system count in maintaining the high standards set up by many engineering specifications. The result has been a great saving in labor and material. Also it keeps all workers in the department on their toes, doing their part in support of the quality program.

The proper functioning of such a system has been built around a number of systematic records which are kept by key operators in the department. Since these records are only as dependable as the man who keeps them, it is stressed that they must be kept up-to-date in order to spot trouble before it is too late to apply corrective measures. Every report goes to the department supervisor at the end of the day. He uses it to summarize the day's activity and then files it for further reference as a check aganist reports of failure during assembly operations or from field service reports.

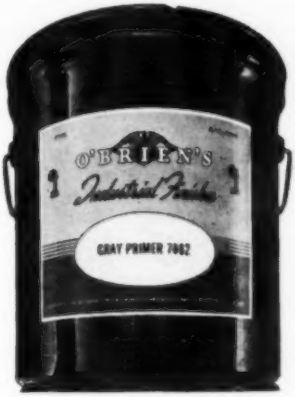
The most critical operations, about which the system is built, are those controlled by the man who serves as paint mixer and equipment attendant; he is responsible for overseeing all cleaning equipment, ovens, spray booths, etc. The functions of these operators will be explained in detail.

All paints, thinners, and other miscellaneous materials are first checked by the plant chemist upon delivery; they are then placed in a storage room of the paint shop where they become the responsibility of the paint mixer. These materials are mixed as required by his own department, and also when needed by production departments in other parts of the plant. As each material is mixed or sent out, a check is made on the amount, its temperature and viscosity.

Check on Paint Materials—Their Quantity, Condition, Etc.

Twice daily a viscosity and temperature check is made on all material in each of the department's paint circulating lines. These results are entered on his daily report, along with the amount of paint or thinner added to arrive at the required viscosity. At the end of each shift an inventory is made of each material, and the quantity used is noted.

The equipment operator compiles a number of reports each of which



Use the Dip That Doesn't Drip!

O'Brien's Gray Primer 7062 takes the drip out of dipping! This unusual baking primer completely eliminates beading. It actually flows backward after draining, levelling out to a smooth, clean surface.

Non-skinning, non-settling, and extremely stable in the dip tank, O'Brien's Gray Primer 7062 performs beautifully under lacquer, synthetic enamels and government specification finishes. Its adhesion to metal is extraordinary. Its applied film is flexible, durable, salt-resistant.

Write us for this primer's outstanding record of performance in dip tank finishing. Ask us to quote on your requirements.

O'BRIEN VARNISH COMPANY, SOUTH BEND 21, INDIANA

O'BRIEN

INDUSTRIAL FINISHES

SINCE 1878

NOT THE MOST – JUST THE BEST

is a control record of a piece of equipment for whcih he is responsible. The operation that requires the most frequent attention is that of cleaning. This equipment consists of a 4-stage washer made up to include an alkaline wash, a hot water rinse, a chromic acid rinse, and a cold water rinse. An hourly check is made of the wash and each rinse section. In the wash, a titration is made to determine the amount of alkaline compound concentration. In the chromic acid rinse a check is made to determine the pH value of the solution. This information, along with the temperature of each section and the amount of material to hold the required solution strength, is compiled on the form shown in Fig. 1.

Twice daily a titration is made on the concentration of the water-wash compound in the spray booths. This information, along with the amount of compound added, is kept and turned in each week to the department supervisor.

The third duty of the equipment man is to keep a close check on each of the department's seven ovens. At the start of each day new charts are placed in each of the temperature recorders, and the date and time are carefully noted on each. Later, a portable recording thermometer is placed on the conveyor line that passes through two of the larger ovens, and a check is made against the permanent recorders. Should they differ, a quick check-up is made to correct the fault immediately. Once each week the portable thermometer is used to check each of the five batch-type ovens, and each chart is dated and filed for future reference.

As every item is loaded on the paint conveyor an entry is made on

BLADE WASHER SOLUTION CONCENTRATION TEST SHEET

DATE 4-15-45 SHIFT B MATERIAL OAKITE #63 COMPOUND—CHROMIC ACID

Time	Temperature			Concentration Ounce Per Gallon	Amount of Compound Added	REMARKS
	Wash Tank	First Rinse	Second Rinse			
8 00	135	140	168	2.1	20#	pH 3.0 2# added
9 00	138	140	160	2.5	0	
10 00	139	142	160	2.8	10#	pH 2.5
11 00	140	140	160	2.4	5#	
12 00	140	140	160	2.5	0	pH 4.9 3# added
1 00	138	137	155	2.5	0	
2 00	133	138	158	2.4	5#	pH 3.0 2# added
3 00	140	140	160	2.4	5#	
4 00						

Paul Thomas #2310
Equipment Operator

Fig. 1—Typical daily record of information that refers to metal washer.

IS THE WORD FOR ARCO PRODUCTION FINISHES

Thanks to modern engineering genius, water power has become a dependable source of electricity for large areas of America. Thanks to the Arco Laboratories, Arco Production Finishes offer a dependable solution for almost any finishing problem. When you specify Arco, you specify dependability.

Paints for Industry THE ARCO CO.

CLEVELAND, OHIO • LOS ANGELES, CALIF.

PAINT SHOP CUFF REPORT #11220 A. James DATE 5-15-45

Time	Cuff #	Parts Hung			Parts Removed			Time	Cuff #	Parts Hung			Parts Removed		
		Stiffener	Support	Skin	Stiffener	Support	Skin			Stiffener	Support	Skin	Stiffener	Support	Skin
8:00 AM	A536	✓	✓	✓	✓	✓	✓								
	552	✓	✓	✓	✓	✓	✓								
	601	✓	✓	✓	✓	✓	✓								
	538	✓	✓	✓	✓	✓	✓								
	563	✓	✓	✓	✓	✓	✓								
	582	✓	✓	✓	✓	✓	✓								
	K 32	✓	✓	✓	✓	✓	✓								
	41	✓	✓	✓	✓	✓	✓								
	43	✓	✓	✓	✓	✓	✓								
	37	✓	✓	✓	✓	✓	✓								
	52	✓	✓	✓	✓	✓	✓								
	43	✓	✓	✓	✓	✓	✓								
	35	✓	✓	✓	✓	✓	✓								
	38	✓	✓	✓	✓	✓	✓								
	34	✓	✓	✓	✓	✓	✓								
	49	✓	✓	✓	✓	✓	✓								

Fig. 2—Paint shop report of all parts hung onto and removed from conveyor.

the form shown in Fig. 2, or one similar. On this form is recorded the assembly number, the parts composing the assembly, the hour during which it was hung, the number of the truck on which it was delivered to the paint shop, and the operator responsible for hanging it. This form is then taken to the unloading station and each part is checked as it is removed from the conveyor. This record, along with certain established information such as conveyor speeds, distance between operations, etc., enables the department supervisor to determine the exact conditions under which any specific item of the hundreds painted daily is finished.

Value of This Checking System And Its Accurate Records

Should defects in the finish be encountered in any assembly operation or under field operation months after the item was finsihed, all that is necessary to determine the causes leading to probable failure is the serial number of the part. From this one bit of information, all finishing conditions from cleaning to baking, including each operator handling the part, can be arrived at in a short time from records which, at the time of entry, might have seemed foolish but which have repeatedly proved to be of great value when sub-standard results must be accounted for.

Vita-Var Receives Second Army-Navy "E"

The Vita-Var Corp., paint manufacturers of Newark, N. J., has won for the second time the Army-Navy Production Award for "meritorious services on the production front."

Since the beginning of the war, the Vita-Var Corp. has been devoting the major part of its research and production facilities to products required by our Government and fighting forces.

Many of the special paints supplied to the various branches of our fighting forces are finishes which render clothing, equipment, and supplies flame proof, waterproof, proof against rain, mud, and sleet—proof against the fungus of the jungles.

Quality...versatility...economy...always have been outstanding characteristics of Egyptian finishes.

Through war years Egyptian's high standards steadily have been maintained, with production largely on finishes for war goods, of course.

For your present war production, Egyptian finishes are available . . . and for your post-war needs, they will be . . . when post-war actually comes. War or peace "quality" and "Egyptian" are synonyms.

We invite inquiries regarding your finish needs, present and future.

THE EGYPTIAN LACQUER MANUFACTURING COMPANY
ROCKEFELLER CENTER, NEW YORK 20, N. Y.

EGYPTIAN
SPECIALIZED PRODUCTION FINISHES

Conveyorized Finishing

BY E. H. TRETTIN
Service Engineer with R. N. Nason & Co.

Experienced service man with a Pacific Coast manufacturer of finishing materials offers several recommendations and suggestions to manufacturers who plan to investigate or install conveyorized finishing.

THINGS ARE beginning to look as if it is now time to prepare for postwar operations. You have probably already been working on new ideas, and have done a lot of thinking about conveyors and production. You want to be ready when the big break comes. You have talked it over with some of your co-workers and you have seen conveyors in operation. They look mighty good going around and around.

Let's see, where do we start to get some action? Brother, you can get as much action as a Marine if you don't watch out. Let's call in an engineer and a manufacturer of conveyor equipment, and let's be sure to include the manufacturer of the finishing material that is supposed to work with all this new conveyor and accelerated drying setup.

Some manufaturers will simply call in a conveyor manufacturer who supplies conveyor equipment only, and he refers you to a supplier of drying equipment. Other concerns insist upon dealing with a company that will take on the entire job. You will have some pretty interesting talks with some of these people, and you will begin

Here fine cedar chests are moving through the finishing room on "flat cars" at low work table height. Specially designed equipment is provided for guiding and pulling the low flat cars over their tracks. Photo, courtesy of Palmer-Bee Co.

to realize that this might turn out to be quite a job after all. You probably never realized that there would be so many different opinions on how to do a simple finishing job such as, for example, table model radios.

Let's assume you have called in one or two people in the conveyor business, as you want some real competition—and others have probably called upon you, as the news that you are in the market has probably gone around. By now the confusion has really started, and you will have suggestions ranging all the way from a simple merry-go-round to a very complicated setup.

One man will tell you that you should be sure and have humidity control equipment, while the next one may tell you that in your case it is not so important, but nice to have if you happen to have a few thousand dollars that you would like to spend. Each idea sounds rather convincing and about this time you are ready to reach for the aspirin, and you wonder how you got into this complicated situation in the first place. You need a cure, or at any rate some good advice.

Call in Finish Manufacturer's Service Man for Advice

The best place to get disinterested advice in this connection is from the service man of your supplier of finishing materials. He is in a position to manufacture finishing materials for you—materials that will work with or without the conveyor system, therefore he has no financial interest in whether you do or do not spend a lot of money on equipment.

He has probably seen a lot of conveyor equipment in operation, and he probably can help you avoid some of the difficulties you might otherwise get into, and he can probably save you a lot of money. At least you can count on his being in an absolutely neutral and disinterested position as far as the money you spend is concerned. He should also be consulted and he and the conveyor and drying oven people should work together, because it will be up to the finishing material supplier to produce materials that will fit into the schedules you have worked out as your ideal, and it may be quite possible that he will have suggestions as to changes or improvements in the schedule you have in mind.

The service man is far more familiar with what you are trying to accomplish in the way of finishing, and what can be accomplished in the way of a finishing

Fine cedar chests supported by trays which, in turn, hang from a powerful overhead chain conveyor. (P-B photo).

schedule, than is the manufacturer of conveying equipment or the manufacturer of drying equipment. The whole problem is one that has to be worked out with complete cooperation among you and the two equipment manufacturers and the manufacturer of the finishing material.

Determine What You Will Make, and in What Volume

First you should make up your mind what you want and what output you plan to produce. Then, if at all possible, investigate existing installations that are in your line, or which meet your finishing requirements. Be sure that you don't arrive at your conclusion by studying installations that do not apply to your particular problems. A conveyor successfully turning out chairs might not meet your situation at all, but a great deal can be learned by studying such installations and fitting them to your needs.

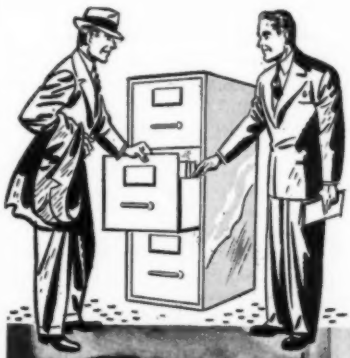
Case goods are often moved through the finishing department, supported on flat trays attached to the hangers under an overhead chain conveyor. Photo., courtesy of Palmer-Bee Co.

Too many managers do not go far enough in planning to get a system that actually fits into their required production. This is extremely important and there are many things to be considered.

Company X might have a floor conveyor that works fine in his plant, but due to the floor plan area and other conditions in your plant, this system might be the wrong one for you to install. An overhead type of conveyor might be better for you. Conveyors can be built and are built to fit into certain conditions, and one type might have a good point that another will not have, but so far I have failed to find either a floor-type or an overhead type of conveyor that will meet all conditions everywhere.

Find Out What Type of Conveyor is Best for Job

If careful consideration and investigation is given to the different types of conveyors and the problems involved, the scales will undoubtedly tip in favor of the type suitable to your needs. To get the right type to solve your problem, you must necessarily go into the matter with thoroughness and work out the merits and faults of various systems with your factory personnel—the men who will later have to operate this conveyor system to produce the results expected. *(Continued on page 54)*



REMEMBER:
EYE APPEAL GIVES YOUR PRODUCT BUY APPEAL!

HERE IS A SAMPLE OF THE VERSATILE M & W METALUSTRE FINISH FOR OUR POST-WAR UNITS

One of the many M&W finishes to give your product eye appeal is Metalustre. This line of metallic enamels is available in 29 standard colors which include copper, bronze, brass and silver metallic finishes.

For use on metal, wood and composition objects, it covers well in one spray coat and drys to a lustrous durable metallic finish. For beauty and durability, Metalustre is a finish that deserves your investigation.

WE ARE HEADQUARTERS FOR SOLVING INDUSTRIAL FINISH PROBLEMS!

There are many "tricks" which can be performed to give your product a desired finish. Let us show you how such a finish may be prepared most economically.

MAAS & WALDSTEIN COMPANY, NEWARK 4, N. J.

PRODUCERS OF LACQUERS, ENAMELS, SYNTHETICS AND SPECIALTY FINISHES FOR ALL PURPOSES

BRANCHES: 1058 CARROLL AVE., CHICAGO 12 • 6 JERSEY ST., BOSTON 15 • 1220 W. PICO BLVD., LOS ANGELES 15

By all means, get the interest and cooperation of your operating personnel in a deal of this sort, because it is amazing how much difference it makes in getting a thing like this set, if the people running it really want to see it succeed. Lots of little suggestions and fine points will come up that will prove to be time savers and money savers. Probably many of them will be points that would not have occurred to you, particularly if your activities have taken you away from really close contact with the operating end of your business.

Consult Your Supplier of Finishing Materials for Help

As these discussions with the equipment people go on, you should be carrying on discussions with the manufacturer of your finishing materials. Guessing as to what can be produced by this manufacturer is definitely out. If your product requires a filling job, you must either do this off or on your conveyor. If you want an ideal layout the product should start on the conveyor and stay there until it is finished.

In this setup the filler is extremely important. If your setup involves only an oil filler, be very careful about the claims as to how soon it will dry clear down to the bottom of the wood pores. A filler that is not satisfactorily dried will surely cause real trouble later; it can easily throw your operation off balance and bring your conveyorized finishing to a standstill.

Your finishing material supplier must provide a material that will fit in the schedule with a reasonable margin of safety. If previous tests have proved this, fine; but you should never take anything for granted. You will probably be limited by space and location and speed of the conveyor, to a certain amount of time for your filling and wiping operation.

Insist on Getting Facts About Performance of Finish Materials

If the finishing material manufacturer and the conveyor and drying equipment manufacturers have worked these problems out together, you will have no difficulty, but you should make them prove their schedule before you go ahead with your installation. Make the service man of the finishing material company show you that he can fill and wipe the filler within the scheduled amount of time that the conveyor would give, and make him show you that the following coats will be dry enough for the succeeding operation in the scheduled drying time and at the heat specified.

Manufacturers of finishing materials who have had experience with conveyor installations can unquestionably supply the proper materials, and their service men will be glad to work with you and with the equipment manufacturers to get you the very best and most practical setup for your particular requirement.

You may think that you have had some headaches in planning this improvement in your facilities, but these headaches are as nothing in comparison with the ones you would have had if you had not planned thoroughly, and with the cooperation of the finishing material people, and the conveyor people, the drying equipment people, and your own personnel.

What Makes Your Conveyor Investment Really Worthwhile

You will probably find that you are going to spend more money than you originally thought you

Taking Pictures Under Difficulties...with WRINKLE!

Getting photographs where the going's tough is the job of this Combat Camera, finished in durable WRINKLE which affords a "non-skid grip" and fills military requirements for a minimum amount of reflection.

Tough and long-lived, WRINKLE presents a distinctive appearance which adds tremendously to the eye-appeal of any product. It likewise enjoys an enviable reputation for cutting production costs, based on the fact that it is a one-coat finish . . . readily applied.

WRINKLE may offer the answer to your finishing problem. For additional information, including the name and address of the WRINKLE manufacturer nearest you, get in touch with us . . . today.

NEW WRINKLE INC

1773 Springfield St., Dayton 3, Ohio

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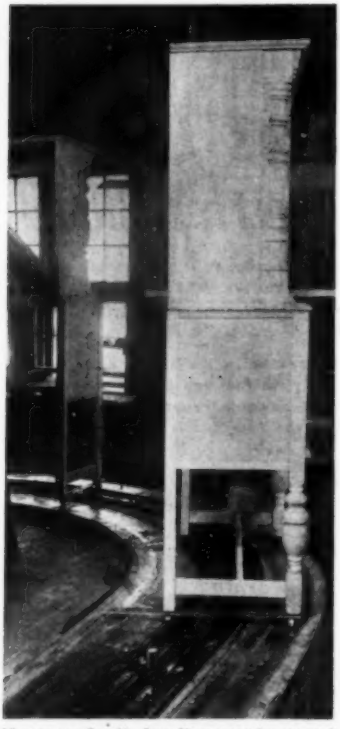
would spend, but do not be afraid of spending a little extra money, because sometimes it is the small additional investment that makes the original plan work. No investment of this type is a smart one unless it is carefully planned and worked out with responsible people. It does take cooperation and it is not by any means a one man's job.

Even when you get to the point where your conveyor people, the drying people and your finishing material supplier all agree that the system suggested is going to work, and you go ahead and install it, you will still find that you will have some trouble and some bugs to get out as you go along, but your chances for success have good odds in their favor and your troubles should be only minor ones.



If you prefer it, furniture can be moved along over a smooth flat bed which is at low work bench height. (P-B photo).

Now a little time has passed and your installation is all completed. Your finishing material supplier is providing you with materials that will work on the desired schedule; you have greatly increased your output, and you are turning out a better product. You are getting out a lot more pieces with the same amount of labor, and you are glad you gave the whole affair the proper amount of thought and careful planning.

You are smart enough, however, to realize that you could not have done it all yourself, but that with the willing cooperation of the various supply people you were relieved of a lot of the headaches that you thought you were in for when you started the project. You are mighty glad you did it.

Cool Air Intake for Air Compressor

MAY I rise to differ with Mr. Fairburn, on page 90 of May 1945 issue of INDUSTRIAL FINISHING? Discussing the location of the compressor in Vic Harris' setup, he advocates a warm-air intake and deprecates the original location in an unheated room.

Maybe I'm all wrong, but in the plants I've set up, I've always tried to get the compressor in a cool spot. Most of my work has been in the South, where humidities run high, but the average for the Middle West runs about 70% for the

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year, as against our 86.5% here in Houston, Texas. Since our average temperature here is approximately 70°F., and the relative humidity averages as stated, each cubic foot of air (averaged over the year) contains approximately 6.90 grains of moisture, or almost exactly 1/1000 of a pound of moisture.

Since the saturation point of air at 50°F. is only 4.076 grains, by cooling my intake air to that temperature, I cause almost 3/7 of the water borne by the air to drop out, and do not have it to trouble me later in traps, separators, and eventually at the spray guns and other production equipment.

Now, going the other way on the thermometer scale, if the intake air be raised 20°, instead of cooled through that range, I find that the saturation point is 14.790 grains per cubic foot. That is, the 20° rise has doubled the moisture-carrying capacity of the intake air, and it is ready, even greedy, to absorb any waste steam or other moisture which may be present. This would double the amount of work which the separators, traps and other removal devices must perform to deliver air as dry, relatively, as that compressed from the average yearly temperature; it would mean 360% more work than the units must do if the intake air were to be cooled to 50°F.

So I have always tried to find a cool spot for the compressor. I set up the intake line so that any water dropping out through cooling the flow before it reaches the compressor may be removed and a low-humidity volume of air — at ultimate temperatures—is delivered to storage.

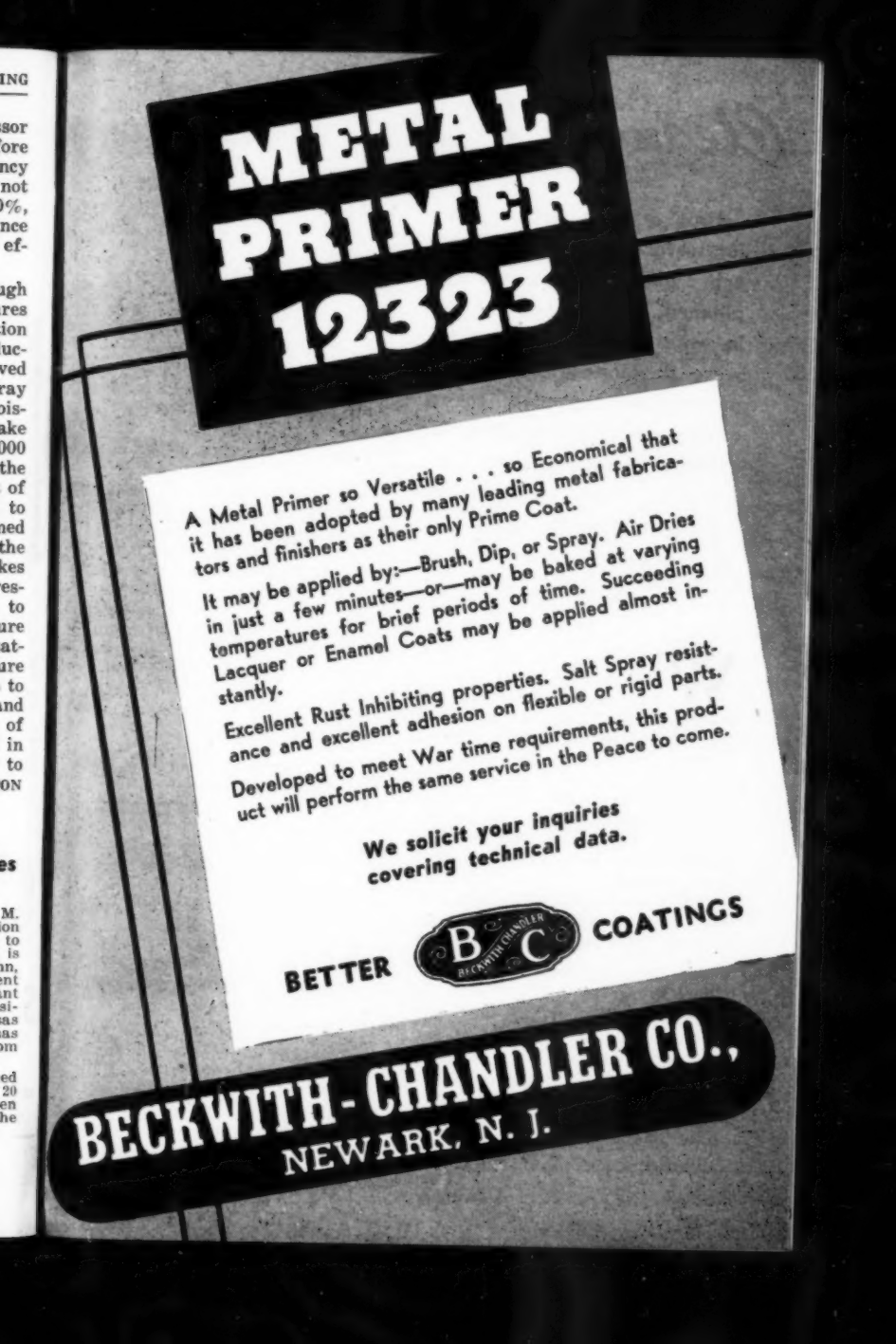
There is a second gain in handling air through the compressor at low temperatures. A "rule-of-thumb" guide is to figure that each rise of 5°F. cuts the compressor volumetric efficiency 1%, therefore a 20° rise would lower the efficiency of the unit by 4%, which must not be subtracted from a base of 100%, but from a much lower value since the average compressor has an efficiency of only 85% or less.

A third gain obtained through keeping the intake temperatures low is in the amount of lubrication required — with consequent reduction in oil volumes to be removed before the air is used in the spray booth. With relatively low moisture content (as at 50°F. intake temperature) there is only 1/2000 pound of water drawn into the compressor with each cubic foot of free air. This water is flashed to steam and must again be returned to water vapor when cooled to the point where this reduction takes place. In a single-stage compressor, for instance, compression to 90-lb. gauge, the final temperature is 459°F., whereas that of saturated steam at the same pressure is only 320°F. This steam tends to emulsify the compressor oil, and thus to promote the formation of sludge which becomes entrained in the air stream, and carries over to the air using equipment.—ELTON STERRETT.

American-Marietta Advances William M. Gibson

The appointment of William M. Gibson to the newly created position of technical and production advisor to the eight American-Marietta plants, is announced by Grover M. Hermann, president. Mr. Gibson, superintendent of the paint company's Kankakee plant since 1940, has held important positions with paint companies in Kansas City, Detroit and Cincinnati. He has a degree in chemical engineering from the University of Missouri.

Arthur L. Gately, who has advanced through various positions in his 20 years with the company, has been made assistant superintendent of the Kankakee plant.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Cleaning, Painting, Drying

How a conveyorized setup for surface cleaning, painting, and drying steel cabinets was planned, engineered and put in, what operating schedules were developed, the number of employees needed, speed of conveyor, and a peek at the estimated finishing costs.

BY RALPH F. LANE

A. J. Brandt Co.
Consulting & Management Engineering

WHEN one of our clients decided to plan for post-war production of one of their prewar products, and at a large increase over their former volume, we were asked to assist them in adopting production methods to produce their requirements. A sales forecast was set up for 200 units per day, which was a 100% increase over their previous sales. The product, an all-steel cabinet of various shaped sides and lid, falls under a kindred category to that of metal furniture.

Production Problem That Our Client Presented to Us

Previous methods of manufacturing were not progressive, and all operations were at the mercy of the individual operator. For example, an efficient operator could prime-spray a unit in less than three minutes, and a poor operator, while sincere in his efforts, consumed five minutes. This was typical of material handlers, strippers, polishers, etc.

In view of this prevailing condition, and because a doubling of the output was planned, there was only one solution—a continuous constant flow of production, in accordance with the principle developed to such a high state in modern automotive production. Therefore we selected a conveyor system, along with continuous paint booths and ovens, to accomplish best results.

Past experience in mass production has proved that conveyorized finishing guarantees: 1) a constant flow, 2) controlled drying times, 3) elimination of that excessive handling which results in damage and unnecessary banks of goods in process. Then, too, the operators are more efficient, operation times are better balanced, good housekeeping is definitely maintained, and floor space requirements are reduced to a minimum.

Our "Checker Game" to Determine Plant Layout

After actual laboratory experiments by several suppliers of paints and finishing materials, we could closely estimate the correct time needed for each of the operations required to produce the product. With our figures at hand, we were able to calculate the correct length of the spray booths, ovens, cooling periods, and space for sanding and polishing operations.

With this information, the next problem was to fit the equipment to the floor space available. Many sets of ¼-in. scale templates were accurately prepared; our checker game of plant layout was the next procedure. After many arrange-

Setup for Steel Cabinets

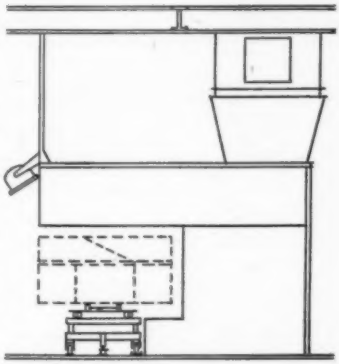
ments were prepared and discussed the layout, as shown in Fig. 1,* was accepted by the client. This layout was then discussed with several representative engineers of the finishing materials concerns and the oven and spray booth companies, so no detail was overlooked.

The third or top floor of the building was selected to facilitate simple installation of all vent stacks. This location also simplified the delivery of the painted product to the final assembly line where items of hardware and interior woods are assembled.

The Product—What, How, When, Where and Why

The product is delivered from the fabrication department by means of an overhead conveyor and is placed on the conveyor in sets; namely a cabinet with its mating lid. On the third floor the components are delivered by conveyor directly to the metal washer in sets. If and when necessary, components can be stored ahead of the washer.

After passing through the metal washer the components are wiped dry to eliminate any possible moisture remaining on the metal. Next, hinges are fastened to the lid, and the lid is attached to the cabinet. A definite reason exists for hanging the lid to the cabinet before spraying. It eliminates excessive handling of the finished lid, standardizes the paint conveyor carriers, and simplifies shading and striping operations by keeping the components perfectly matched. Following this operation the cabinet and lid assembly travels to the loading point of the continuous paint conveyor.



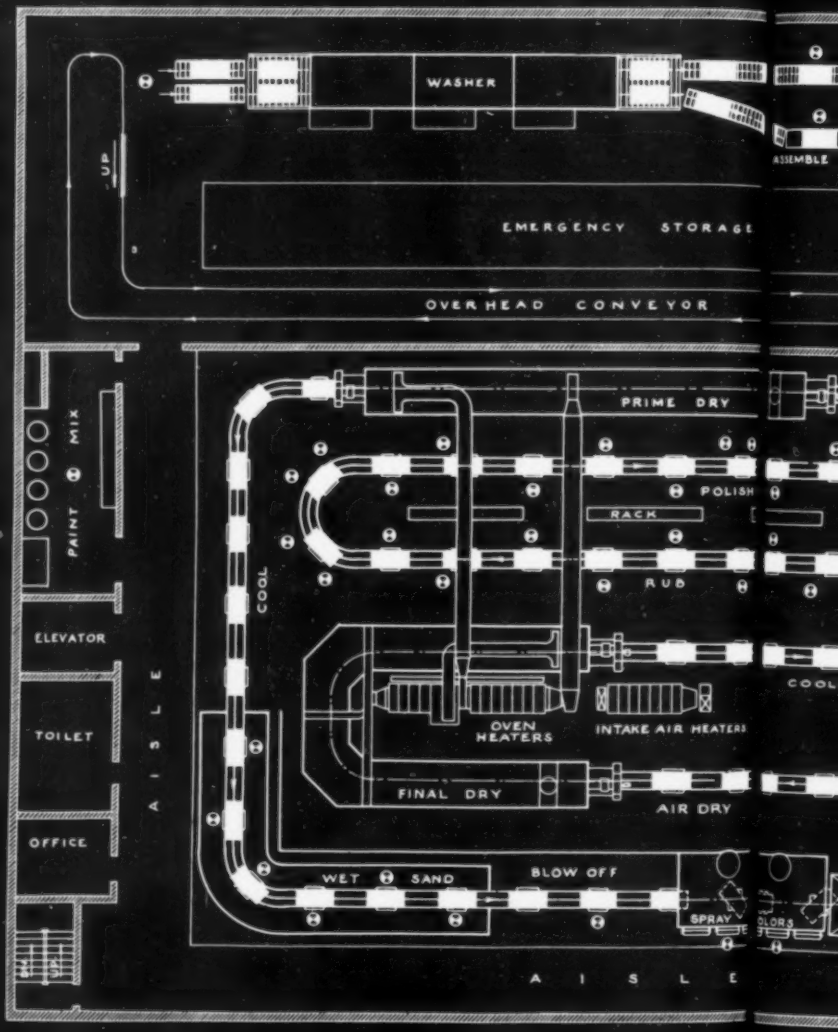
End elevation of typical spray booth showing how a steel cabinet (dotted lines) moves through on its carrier.

Starting on the Paint Line; Prime Coating; Drying; Sanding

First operation on the paint line is spraying a protective coat on the inside of the cabinet and lid. This is done in about 2½ minutes. As in all operations which follow, the operator indexes the cabinet by means of the fixture on the conveyor carriage. Next, the outsides of cabinet and lid are prime coated by spraying. This operation is immediately followed by a trip through primer drying oven, a 10-minute bake at 325°F.

After a cooling period of about 15 minutes, the wet sanding operation is performed. This is accomplished by rubbing the surfaces with a wet pad only; no constant stream of water is necessary. By actual tests it was found that 15 minutes cooling before applying

*The floor plan and layout referred to here as Fig. 1, is a blueprint which spreads across pages 62 and 63.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AIR DRY
WET SAND
BLOW OFF
SPRAY
AISLE

ASSEMBLE LID
TO PAINT CONVEYOR
BENCH
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LACQUER
AIR DRY
SHADING

the water is sufficient. Something like 15 minutes is required to perform this operation — making a break-down among six operators on the sanding deck. A tack-rag operation follows to insure the removal of all moisture from the surface.

Color Coat Spraying, Plus Shading and Clear Coating

The color coat is then applied in a 28-ft. continuous spray booth. This is a 2-man operation, both men working along the same side of the conveyor, and the work is indexed by means of the carrier. The time per operator is approximately 2½ minutes.

Color coat spraying is immediately followed by the shading operation, wherein a very light fog is sprayed around the top and bottom moldings. This does not require the conventional type of spray booth. Only a hood connected to an exhaust stack is needed to remove the fumes. Actual experiments proved that the shading could be done within two minutes after the color-coat spraying.

After a brief air-drying, the final or clear lacquer coat is applied. The work is again indexed by the operator and the cycle time is approximately 2½ minutes. The clear lacquer serves as a protective coat for the color and shading coats, and it provides a high gloss finish after polishing. An air-drying of ten minutes follows, and the product enters the final drying oven (built in U-shape) where the coating dries for 15 minutes at 180°F.

Following a 20-minute air-drying (or cooling period) the lacquer coat is wet-rubbed. Like the primer sanding, this too is done with a wet pad. It is a 30-minute operation, but is broken down among 12 operators at 2½ minutes each. Final polishing follows immediately; here the same time cycle and number of operators are required as for wet rubbing.

After the cabinets receive their final polishing, the conveyor carries them to the final assembly department where every cabinet is removed from the conveyor. The conveyor makes a 180° turn back to the finishing room. The total time cycle from the loading station to the end of the final polishing operation is 3½ hours. In final assembly some items of hardware and interior wood linings and partitions are assembled.

200 Units in 8 Hours; Everything Conveyorized

This conveyorized system was designed for turning out a maximum production of 200 units per 8-hour day, with a conveyor speed of 3.88-ft. per minute—a very slow speed which allowed for a minimum length of spray booths, ovens and rubbing decks, and provided for the layout to occupy limited floor space.

The layout or equipment offers no problem if production schedules drop below maximum. If production schedules drop, an adjustment can be made in personnel; for example, fewer conveyor carriers would be used, fewer rubbers and polishers would be required; and the spray booth arrangement is ideal for doubling up on the operator. It is only natural to assume that when production goes down, direct labor cost per piece goes up. Furthermore fuel costs per hour remain practically constant. The same supervision, as well as maintenance, is necessary.

If production curtailment is necessary it would be more desirable to maintain the maximum person-

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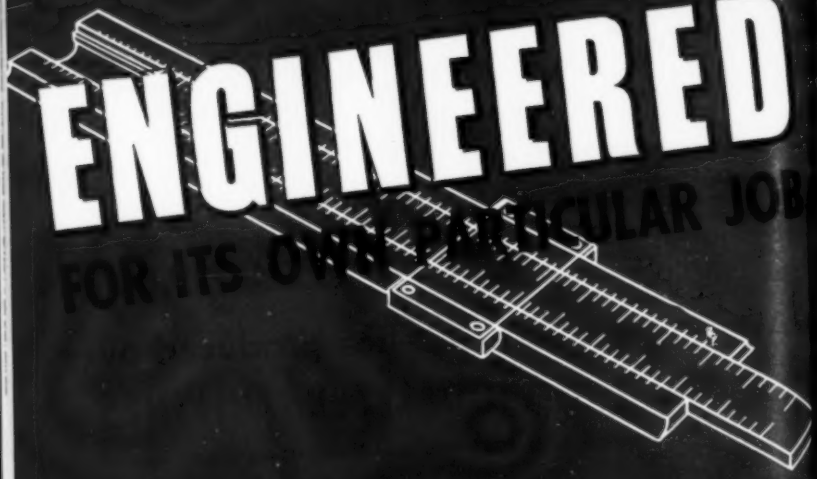

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No two Binks spray painting installations are exactly the same. Each is tailor-made to accomplish the specific job it has to do. Such factors as size of product, type of finish, plant layout, volume of work, and many others enter into the final plans for a finishing department which combines high efficiency and low operating costs. Take for example the Binks installation illustrated here. It is part of General Electric's modern plant at Philadelphia. Large units are carried into a Binks Down Draft Water Wash Spray Booth (left) by special conveyors. Paint fumes and over-spray are quickly drawn down through grills in the floor, under which they are thoroughly washed out of the air. The cleaned air is then vented out-of-doors (above) without creating a cleaning problem or a fire or explosion hazard. As peacetime reconversion comes closer, it will pay you well to check the efficiency of your own finishing department. A Binks engineer will be glad to help you plan your finishing now to meet the highly competitive markets of tomorrow.

BINKS MANUFACTURING COMPANY

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nel and decrease the hours per work week. Fewer hours per week would reduce the consumption of electric power, lighting, heating and oven fuel. It is more desirable in a small community, where this plant is located, to maintain a maximum force, as these workers have little opportunity to secure employment elsewhere—and if they did, it would be difficult to get them back when needed. The labor market is limited; new personnel would be green, and training them to efficiency would be necessary.

Removal of rejects from the line was carefully considered. It was decided that there would be no advantage to remove a rejected cabinet until it arrived at the end of the polishing operation. Here it can be removed and repaired in a salvage department especially designed for this purpose. With a continuous line, the labor is always present whether a reject is removed or an empty conveyor truck passes by. Some idle time must be absorbed but little is anticipated with this system.

Conservative estimates of direct labor costs were completed, and the entire department including the metal washer, lid assembly, pro-

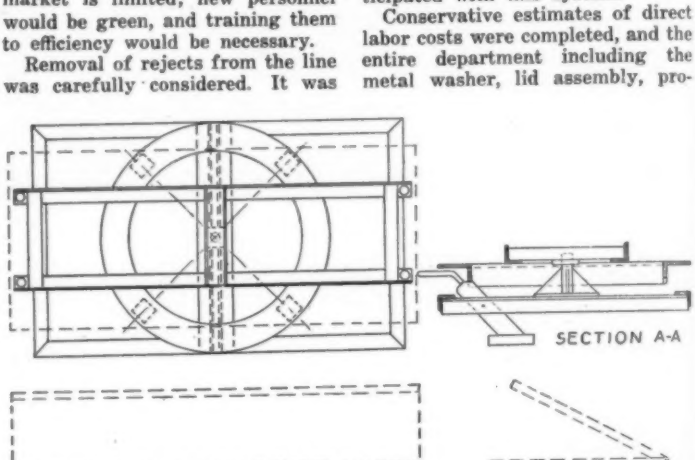

Fig. 2—Plan and elevations of four-wheel work carriers which are moved along by a chain conveyor centered between tracks for carrier or dolly. Dotted lines above elevation views indicate position of typical cabinet.

tective inside coat, prime spray, wet sand, color spray, shading lacquer spray, rubbing, polishing, and loading and unloading, requires a total working force of 51 men, including an oven tender, paint mixer, supervision and two general utility men who act as group leaders and relief operators.

Eliminating the indirect labor, the washing operation, lid assembly and supervision, the actual surface finishing, including inside protective coat, requires 43 operators at an average rate of 90 cents per hour. Unit cost is $1.55 or slightly less than 3½ cents per square foot.

No direct comparison to prewar cost is available, as the product was completely redesigned, paint specifications are entirely new, metal specifications are new, and figures are not available for past excessive material handling damage and salvage costs.

It is safe to say that, with conveyorized operations, the personnel becomes equally efficient. Inefficient workers are easily detected. With the slow speed of this conveyor, no individual operator need ever become over-fatigued. The original labor estimates were based on using inexperienced labor, conveyorized production being entirely new to them. When the department reaches peak efficiency it is believed that a reduction of 15% in labor cost will be possible.

Overhead Conveyor: The conveyor to deliver components from the fabricating shop to the metal washer is the conventional overhead trolley type, with work carriers. It needs no explanation due to its commonplace application in all industries.

Continuous Washer: This machine is a continuous, fully enclosed, 3-stage unit, with roller chain cross-bar conveyor. Cabinets with their respective lids are placed on the conveyor in pairs, at approximately 6-ft. centers. Spray nozzles at 45-lbs. pressure are positioned for spraying the top, sides, and bottom. The components are placed upside down, since no drain holes are provided. The cleaning machine is approximately 10-ft. wide by 56-ft. long. The first chamber applies phosphoric cleaner; the second clear water; and the third chromic acid rinse, followed by a blow-off chamber using hot air.

Tank temperatures are maintained at 180°F. by means of immersion-type gas heaters, eliminating additional load on the boilers which are already loaded to capacity. The conveyor is equipped with variable-speed drive, which allows flexibility for future applications.

Spray Booths: The spray booths are water-wash type, with open front and silhouetted side panels. Booths are equipped with vapor-proof fluorescent lighting, circulating pumps, clean-out tanks, necessary exhaust fan and vertical stacks through the roof. Water-wash booths were selected for their cleanliness, elimination of paint-pigment deposits on neighboring property, and minimum maintenance due to cleaning. They also minimize fire hazard and insurance rates. The total air removed by exhaust fans at all booths is approximately 120,000-c.f.m. at 150-ft. face velocity.

Replacement Air System: A system is provided for replacement air. It is located in a penthouse on the roof, approximately one bay square, and houses the intake louvers, air filters and fans. The air is tempered from 0° to 70°F. by means of gas-burning units, the same as for the ovens located on the third floor. All gas and elec-

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INDUSTRIAL FINISHES

tric controls are placed in a central location, as will be noted on the layout drawing. Again gas was selected here to eliminate additional load on the boilers. The capacity of the system is approximately 130,000-c.f.m.

Paint Conveyor: All types of finishing conveyors were considered. Our final selection was the floor type, much the same as is used for automobile bodies. It is constructed of a plate and channel caster track with the chain track in the centers. All members are held together by flat tie bars on 5-ft. centers. The chain is No.458 heat-treated forged-steel, with rider plates on proper centers and extended pins for application to the carriers. This type was selected for its simplicity, economy of operation and adaptability to other products in the furniture line.

The curves are equipped with ball-bearing rollers in the chain track, one 180° curve being a screw-type take-up. Lubricating oils or greases cannot fall on the work in process.

Two drives were selected to insure smooth operation, eliminating surge. They are of the caterpillar type and are mounted on the ceiling of the floor below. The drive shaft extends through the floor slab to the caterpillar sprocket. The speed variation is 1½ to 7½-f.p.m.; operating speed is 3.88-f.p.m. Speed variation allows for future changes in operating and drying times. The conveyor is approximately 900-ft. long.

Little mechanical trouble can be expected of a conveyor of this type. With proper care it will give years of uninterrupted service. The drives are the floating balanced type, synchronized for proper speeds, and equipped with safety limit switches in case of excessive drag. Chain breakage can be repaired in a few minutes. Spare parts for chain, reducer, caterpillar chain, and sprockets are carried in stock. All motors, V-belts and pulleys are standard items. Cross section of the conveyor is shown in Fig. 2.

Work Carriers: The work carriers, shown also in Fig. 2, are spaced on the conveyor at 9-ft.4-in. centers. They are equipped with roller-bearing casters, 5-in. diameter wheels; they have a 48-in. wheel base and a 30-in. tread.

The carrier is equipped with a rigidly constructed indexing cradle, with locking device at 180°, and it operates on ball-bearing rollers. The cradle is indexed as required by the spray booth operators.

The product is located on the cradle by a 4-point contact in embossed cups on the bottom panel. The carrier is entirely free of any members that might obstruct free application of the spray gun to the product.

Ovens: Both ovens are floor type, approximately 5-ft. wide inside, by 6-ft. high inside the panels. The panels are 4-in. thick and are filled with rock wool insulation. They are of the interlocking type. Panels are attached to a rigid structural steel frame.

Heater units for both ovens are located on the floor, all in a group to minimize piping and wiring. Additional units can be added if future changes require increased oven temperatures. They are the direct-fired gas type, sectional design, equipped with recording controllers, gas pilots, and all approved underwriters' safety devices. The entrance and exit vestibules are equipped with air seals to prevent heat losses.

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Color Conditioning of Industrial Interiors

A POSTWAR program for scientifically "color conditioning" industrial interiors was announced today by the Du Pont Finishes Division following extensive study of employing functional color to improve employee efficiency, health, comfort and morale.

Described as the science of determining the correct industrial color environment for maximum vision, the system has been developed by Du Pont in collaboration with Faber Birren, leading industrial color authority. Among the benefits of "color conditioning" are listed increased production, improved quality of workmanship and reduced personal injuries.

The "color conditioning" technique is designed to protect employees against eye-strain by reducing glare and eliminating extreme contrasts between light and dark. It recommends restraint in using color, especially distracting, over-stimulating hues, as well as abolishing light-robbing dark areas.

Research findings have determined correct colors for factory walls, for machines, and for backgrounds within the field of vision. Surveys of entire plants where an integrated color system has been in effect from front to rear door demonstrate that uniform wall, dado and equipment painting, with a "change of pace" for corridors, stair wells and washrooms, yields beneficial results as revealed in comparative safety, production and absentee records. Only a few colors in combinations need be utilized, the studies show.

The announcement emphasized that the program, although designed to introduce more color into the industrial scene, is not mere "interior decoration" of plants, but the outcome of long-term research that already has done much toward "putting color to work" for industrial efficiency. Hundreds of case histories based on color installations in all types of plants were compiled and studied.

New colors have been developed for industrial interiors. These are not decorator's colors in the bright, clear range, but hues subdued in tone and unobtrusive and practical. In selecting the colors, illuminating and color engineers studied light-reflectance qualities, hue characteristics, influence of different kinds of illumination, and psychological characteristics.

Applications of "color conditioning" were made in many of America's large industrial plants. These case histories were studied in determining the functionally correct colors for industrial use.

Under present conditions when raw materials for paint are critically short, the color-conditioning colors are available in limited quantities only, it was stated.

"Color conditioning" began in hospitals where scientific studies of color were made to aid the visual acuity of the surgeon. Similar investigations later were performed in schools and factories. During 1937 and 1938, experiments were carried out in one of the first nation-wide applications of color to industry—scientific standards being established and applied to industrial plants throughout America.

In 1940, Du Pont, with the cooperation of Arthur A. Brainerd of the Philadelphia Electric Company, perfected its "Three-Dimensional Seeing" technique of applying color to machine tools to improve operators' vision. This was announced before the 35th Annual

FINER DU PONT FINISHES CAN HELP SELL YOUR PRODUCT TOMORROW

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If you have a war product that needs expert finishing strategy to carry it through production, let Du Pont help. And if you have a peacetime product in the development stage, plan now with Du Pont for a finish that will add color, serviceability and sales appeal. We'll be glad to help, provided it doesn't interfere with the war

FROM THE LAND OF COTTON—Over 20 years ago, Du Pont chemists perfected a new finish—DUCO. Its base was nitrocellulose, obtained by treating cotton linters with nitric acid. DUCO has since become a trade name symbolizing enduring beauty—on furniture, refrigerators, signs—on automobiles, trains, and airplanes. Manufac-

with Du Pont for a finish that will add color, serviceability and sales appeal. We'll be glad to

bolizing enduring beauty—on furniture, refrigerators, signs—on automobiles, trains, and airplanes. Manufac-

MAKING A FINISH STAND STILL—In spraying an odd-shaped war product, two coats of a specification finish were being used which sagged and ran, caused rejection. The manufacturer was at wit's end—tried a more viscous finish, ended up with a clogged spray gun. A Du Pont Finishes Engineer came on the double, recognized the difficulty, recommended a special solvent and spray gun adjustment. Production jumped from 500 to 2500 units per day, thanks to Du Pont service.

MEASURE FOR MEASURE, manufacturers of service station equipment favor DULUX for its color stability and resistance to oil, grease, and hard service, its easy upkeep. Whether or not DULUX is the perfect answer for your peacetime product, call in Du Pont for consultation. Our years of practical finishing "know-how" are at your disposal. Write:

E. I. du Pont de Nemours & Co. (Inc.), Finishes Division, Wilmington 98, Delaware.

DEPEND ON DU PONT FOR BETTER FINISHES

REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

Convention of the Illuminating Engineering Society. Since then several thousand firms have replaced the old dark machine tool gray with "Three-Dimensional Seeing" light gray and buff combination with consistently beneficial results.

A year later, the same companies completed a joint study, reported in a technical paper, "Salvaging Waste Light." This was announced at the Wartime Lighting Conference of the Illuminating Engineering Society, and reviewed the functional value of color as applied to the entire facilities of industry.

"Color Conditioning" embraces these prior Du Pont developments, supported by the practical experience of Mr. Birren and the results of the case histories.

Fixing Marred Surfaces of Plastics

SOMETIMES, in the production or handling of molded plastics, the smooth surfaces are slightly marred or discolored by the presence of dust or foreign matter in the forming mold, or for some other cause.

The very mild blemishes can be removed by buffing, using a suede buff at a speed of 1750-r.p.m. The speed and compound used must be such that no excessive heat will be generated, as this would burn the surface and cause rough spots. The compound I prefer is the moist type.

If there are deep scratches, or coarse roughness on the surface, start your smoothing operation with No. 320 wet-or-dry abrasive paper. Let the paper soak in water for 20 to 30 minutes before using it. Wet the plastic surface with water and proceed with your sanding operation, but work carefully. When you have removed the roughness or scratches you can proceed with buffing.

The buffing compound I use does not generate much heat and it puts a good face on the buffing wheel. While it is difficult to bring back the original finish, the method just described does a good job and comes as near as possible to restoring the original finish.—A. MEDEL.

Painted Machines as a Safety Feature

ROBERT A. MASSEY, representative of the DuPont company, at a recent meeting of the greater Grand Rapids (Mich.) Safety Council, told members that colors, as applied to industry, have been emphasized more during this war than ever before in our nation's history.

"Industrial efficiency," Mr. Massey declared, "has been stepped up by the scientific application of various colored paints to machines. Colors highlight the working parts, help remove dangerous shadows and reflect light on the working surfaces."

Mr. Massey also added that through various colored paints employed as safety devices, countless human limbs and lives have been saved.

The meeting was part of the council's industrial safety educational program, and was attended by plant protection officials, engineers and industrial foremen.—I.

Hilo Wins Second Army-Navy "E" Award

The War Department announces that the Hilo Varnish Corp., 60 Stewart Ave., Brooklyn, N. Y., has won, for the second time, the Army-Navy Production Award for meritorious services on the production front.

stille-young *finishes protect*

against cold • against heat • against extreme weather conditions

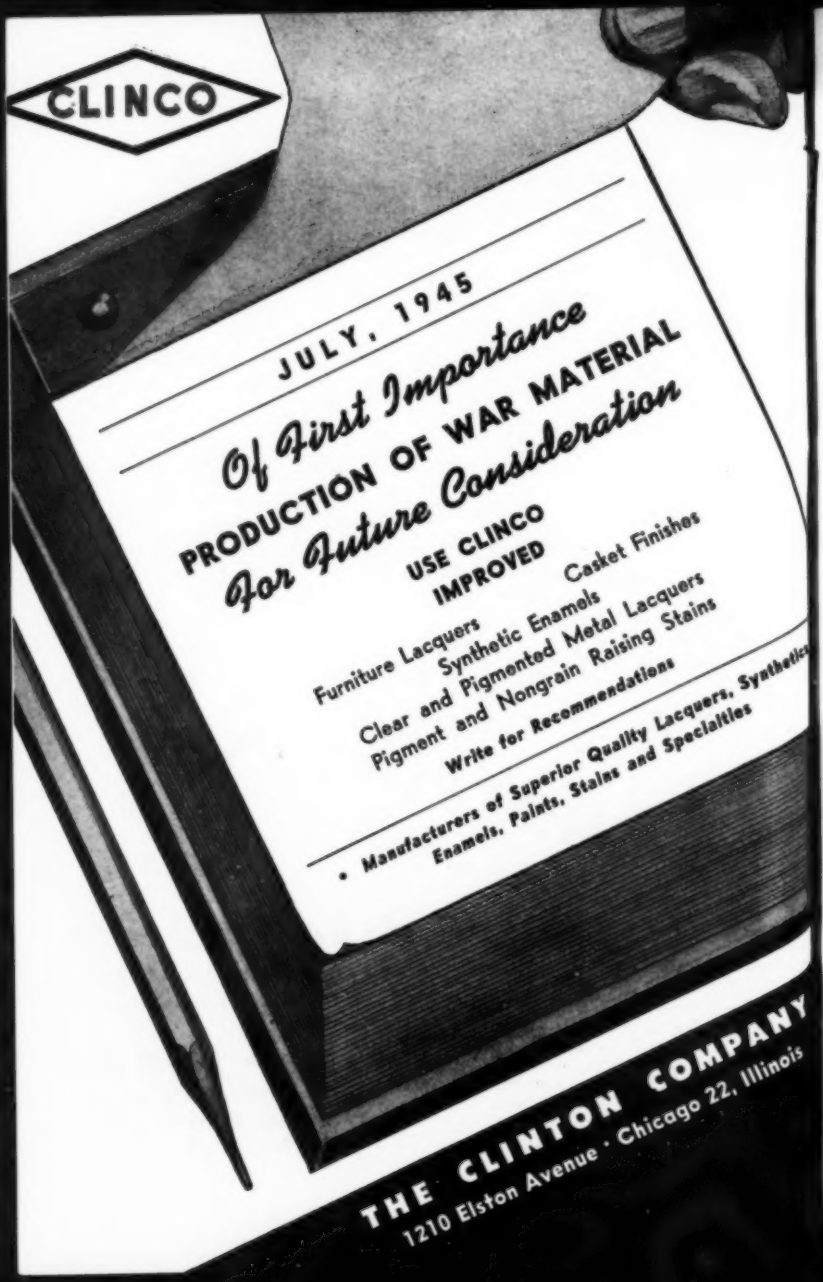
The impact of war has made it necessary for us to use new raw materials—new formulations.

These lessons, put into practice now, will have greater value for our customers and for ourselves in the post-war period, in improved products and greater service.

stille-young

manufacturers **• lacquers, fillers, stains, enamels, paints**

Chicago 14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Finishing Technique for Prefabricated Homes

Mass production of prefabricated houses calls for painting of these various sections in the factory. Here is the story on how this painting is handled effectively and economically in one western plant.

BY M. J. TURNER

THE PRINCIPLE of mass finishing might be termed universal. It applies to any product, regardless of size—from pencils to locomotives. This fact convinced engineers of the Prefabrication Engineering Co., Portland, Ore., that prefabricated homes could be finished on a continuous basis.

While R. F. Johnson, manager of the firm, had had experience with prefabricated homes, the type of construction which the Housing Research Department of TVA had finally approved for assembly line production was quite new. Consequently, a basic engineering job was required to adapt existing facilities to finishing housing units.

A complete housing unit as designed and built by this company, consists of 2-room, 3-room or 4-room sections. Each section is broken down into ceiling, wall, floor, window and door components. All of the latter are produced in mass quantities according to standard specifications. The finished parts are fed to a main assembly line from sub-assembly lines.

For housing the new plant there was available a high storage build-

Left: Spraying deck coating on top side of a ceiling section. Right: An 8x29-ft. ceiling section ready to be spray painted with a flat white.

Spray painting outside of a room.

ing, approximately 60-ft. wide by 600-ft. long. Before any definite finishing procedure could be set up, it was essential that exact information regarding each assembly operation must be obtained—fabricating floor and roof sections, for example; laying of linoleum, installation of plumbing and wiring, etc. Extremely important was the time required for the application of each coat of paint and its drying time. So, while the general specifications designated the number of finish coats and types of finishing material to be used, the materials themselves had to be formulated to meet application and drying time limits.

The storage building was decked and the upper level was given over to the actual construction of house sections, including the installation of concealed wiring and plumbing.

Linoleum is laid on the flooring, and the deck side of each roof section, which measures 8x29-ft., is covered with a heavy pre-treated canvas, laid over an embedding paint.

One spray room is located on the upper floor. Roof sections are carried through this room in vertical position, under a monorail and electric hoist. Two men work in this booth. One sprays the ceiling side of the section with a fast-drying flat paint, while the other sprays the canvas-covered deck side with a specially formulated coating. After being painted, the sections are lowered in a horizontal position to the main assembly floor.

Four complete assembly lines are in operation on the main level. All of the fabricated components of a complete room section—roof, walls, floors, etc.—are placed for assembly on a 4-wheel dolly. As the section moves down the line on its dolly, it passes different stations where "built-ins," surface wiring,

Spray painting inside of a room.

Resourcefulness....

THAT IS WINNING THE WAR!

From custom electric signs and theatre marquees, to conveyor line production of radar cases! This is the story of Donnelly Electric and Manufacturing Co. (Division of Donnelly Advertising Co., Boston) contribution to victory!

Plans were made for top production. Equipment was selected and space was utilized with this goal in mind. Handling operations and time between operations had to be minimized. The finishing system we recommended is a progressive, two-handling, continuous operation. Parts are hung on conveyor and pass through priming booth. Berry Brothers' #10 Ferro-chrome Primer is applied and the parts then travel seven minutes to the enamel booth.

At the entry to this booth, the first coat of Berry Brothers' Infra-bake 4.5 Gray Semi-Gloss Enamel is applied. The parts then travel five minutes to the next spray station and the second coat of enamel is applied. Then they go through the infrared unit for 7 minutes, and to the shipping department.

Without products tailored to fit the required timing, a longer conveyor, more floor space and less production would have resulted. This same "Know How" is available to you. Write for further information.

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QUALITY FINISHES SINCE 1858

visible plumbing and windows and doors are installed. Just before entering a spraying room, each room section is given a thorough cleaning up.

In each of the four finishing rooms, located at the end of the four assembly lines, are two spray operators. One sprays the room section interiors and the other sprays the exteriors. Interior walls and trim receive one coat of a soft gray semi-pigmented lacquer sealer, followed by a coat of dull-finish lacquer. The exterior of the section is given a coat of fast-drying paint. Ten colors including white are used on this last operation.

Final painting of trim by brush.

All colored housing sections are trimmed in white, while white houses are given a blue trim. All frames, doors and windows are pre-primed. Since two colors obviously could not be conveniently applied in the same booth, as each section moves out of the finishing room, a second or finish coat is brushed onto the trim.

Plumbing and wiring are tested and the sections are given a final cleaning up. When they have reached the end of the assembly line, the sections are loaded directly onto either trucks and trailers or railway flat cars for delivery to the erection site. Here the sections are joined together and plumbing and wiring connections are made.

By reducing operations to a simple level and planning a well-integrated finishing line, the Prefabricated Engineering Co. is able to complete 52 to 56 sections per day, which is an enviable record in the industry.

Bonus Pay for Suggestions

EVEN the foremen and lesser executives of a company are interested in "The Ghost's Walk" or "The Eagle's Scream"—and their incentive to turn out good work is directly and closely related to the desire to receive a sizable check each payday. Many of the larger manufacturing concerns help meet this need for additional or augmented pay by offering bonuses in the form of payment for workable ideas on plant, process or product betterment thought up and submitted by employee personnel.

Contrary to generally accepted opinion, it is not necessary for a company to employ several hun-

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PROTECT
in war as in peace!

TODAY, Vita-Var Product Finishes protect equipment, vehicles and armament used by the Armed Forces. Today, we can take care of your requirements of finishes for the Armed Forces.

TOMORROW, when you convert to civilian production, Vita-Var Product Finishes will deliver the same high-quality protection for all products.

Write for the Vita-Var Product Finishes Folder on metal, wood and other finishes.

VITA-VAR CORPORATION

PAINT ENGINEERS SINCE 1888 • NEWARK, NEW JERSEY

dred men for such a coin-your-ideas plan to function. In one small organization, with a payroll averaging 36 names—on three shifts, or an average of a dozen men per shift—1944 witnessed the adoption of 19 employee suggestions, and the awarding of a bonus for each of seven others which were practicable but not utilized due to process or material shift between the time the suggestion was made and when it could be prepared for adoption. These 26 suggestions each netted an employee an extra award which ranged from the minimum of $5.00 to $50.00, and which averaged $13.75 over the entire number.

Some of the men were always on the alert for new ideas—spending their spare time visiting similar plants within travel range, watching for kinks and gadgets in other industries which might be adapted to their own job, and studying operations and processes within the plant beside their own limited scope of work.

Out of the plan, for the management, has come an accurate indication of the initiative and resourcefulness of the individual men—forming a backlog of experience from which will be drawn future foremen and supervisors when, as, and if the plant's output grows with the conversion to peacetime production.

One man, with all the qualifications for a leader except the spark of initiative, was high winner in number of ideas accepted. His dollar total ranked second, due to the relatively minor nature of the improvements he suggested. Had he worked consistently at bettering his own and adjacent operations, his reward would have been much larger. But he was content to rock along on his regular pay until some special emergency arose which demanded extra cash. Then he would get busy—mentally as well as physically—and out of the huddle with himself would come an acceptable idea; and, usually, the award for the development would meet, or at least stave off, the urgency of his financial crisis.

Large companies usually award on some such base as 10% of the annual saving effected through adoption of a suggestion. This scale, for a small concern, might prove inadequate. In some instances, with the company cited, the award all but absorbed the yearly gain obtained — but since there would have been no savings if the suggestion had not been made, the company profited by making the award because this stimulated suggestions for the development of other and more remunerative improvements.

No wage earner, be he porter, painter or president, is allergic to more pay. And, in these days of wage freezes and overtime ceilings, the incentive bonus helps to bridge the ever-widening gap between fixed income and skyrocketing costs in the accepted standard of living. —ELTON STERRETT.

Flammable solvents should be stored and handled in equipment installed in accordance with the standards of the National Fire Protection Association.

For extinguishing fires in flammable solvents, an ample number of portable fire extinguishers, that bear the approval of Underwriters' or Factory Mutual Laboratories, should be provided. Several types suitable for use on fires in flammable liquids include foam, vaporizing liquid, carbon dioxide, loaded steam, and dry powder.

THROUGH LEADING JOBBERS IN PRINCIPAL CITIES

...AS SIDE-TRACKED CIVILIAN PRODUCTION IS SWITCHED BACK TO THE MAIN LINE

SPRAYIT AND ELSCO PRODUCTS
SPRAYIT
Paint Spraying Equipment, Air Compressors, Spray Guns, Pumps, Air Tools, Insecticide Sprayers, Sanders, and Allied Finishing Equipment
ELSCO
Electric Motors, Generators, Valves, Pumps, Hydraulic Cylinders and Controls... for Aircraft, Automotive and other Industrial Application

Here at Electric Sprayit Company we've already received the "high sign" from the yardmaster in Washington that it's OK to start switching civilian production back to the main line. We'll be set up on a double track schedule too, with merchandise that is streamlined to meet every marketing demand...superior quality...competitive prices... fair profits...good service...and every other facility to make Sprayit and Elsco two of your favorite products. These new and better lines will be available "Through Leading Jobbers In Principal Cities Throughout the United States." Keep in touch with your jobber, or write Electric Sprayit Company, Sheboygan, Wisconsin, for further particulars.

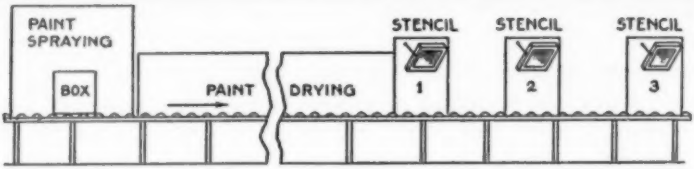


Fig. 1 — Boxes or cartons travel over a roller conveyor which carries them through a spray booth and drying oven, and past the silk-screen stencils.

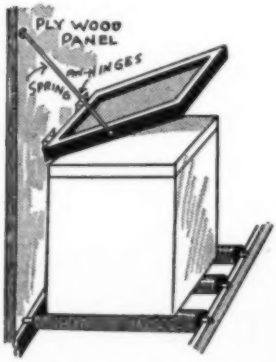
Silk Screen Stenciling

(Part II—Box Marking)

BY BERT ZAHN

THE WAR HAS brought out many new and important uses for silk screen stenciling work. One use that has saved a lot of time is the marking of boxes—paper, wood and metal. With the flexibility of silk screen stenciling it is possible to imprint names and directions on all sides of boxes at a minimum cost.

Considering the ease and simplicity with which copy can be changed, short runs are economical. All that is necessary is to pull the pins from the hinges, remove the screen stencil and replace it with a different screen stencil. A complete unit suitable for imprinting ammunition cases, but which can be used for various commercial purposes, is shown in this article.



Close-up of a box or carton in position for the stencil to be lowered and the process paint to be applied.

In review of this operation, you will note that the entire finishing and stenciling operations have been drawn together. Referring to Fig. 1, and starting at the left, the blank case enters the spray booth. It is carried forward on a flat bed type of conveyor. First, the box is completely sprayed. Then it continues from the spray booth through a trap door and enters the drier compartment.

The paint drier can be built to any dimensions to handle various size boxes. If the boxes are paper or wood it is desirable that the temperature be no greater than 150°F., supported by an adequate circulating air system. The accepted source of heat will depend largely upon local conditions and available facilities. It may be heated by infra-red heat lamps or gas or oil heat. As the boxes emerge from the drying tunnel they enter and pass through a short cooling zone before reaching the stations where silk screen stenciling will be performed.

We developed into 8 Ball *Specialists*—

—by OVERCOMING every wartime material shortage

Judicious use of available raw materials has enabled us to help our customers out from behind the 8-ball of wartime shortages and restrictions. We at Reliance have not disappointed a single customer during the emergency. In every instance, we were able to supply sufficient materials for full production.

With this enviable record to date, we feel confident of being able to continue to produce from now on with the same regularity with which we delivered in the darker days.

Rely on Reliance

RELIANCE VARNISH CO., Inc.

Note the position of the silk screen equipment, as compared with the initial operation of coating the cartons. For practical purposes the screens are hinged to upright plywood panels, with springs attached to hold the frame at an angle of about 40° when it is not in operation. The position of this screen and the registration of the approved imprint will vary considerably, depending upon the physical characteristics of specified cartons or cases.

The first operation is the printing on the top of the box. Following this step the operator immediately changes the position of the case and then lets the box continue to operator No. 2 who has a stencil with the desired copy. Following this operation, he turns the carton face up and sends it on to the third station where the final imprinting is completed. The completed boxes are then trucked to the filling department where they are packed and made ready for shipment.

With this three-station stenciling setup it is possible to imprint a 3-color design on each box. Many variations of this setup and new possibilities for increased production will occur to practical men.

Colors Designating Pipe Lines

COLORS that have been selected as being standard for identifying pipes by the American Society of Mechanical Engineers, the National Safety Council, the National Board of Fire Underwriters, and the American Standards Assn., for normal interior conditions, include the following:

Red: Fire-fighting equipment.
Yellow: Gas or dangerous materials.
Blue: Steam or water exhaust and protective materials.
Green: Air lines and safe products.
Purple: Extra valuable materials.

For severe or abnormal industrial conditions, the basic colors are used, although slightly different in hue when necessary, where chemicals or fumes are encountered. All piping is to be painted its entire length unless it is covered with insulating material or some type difficult to paint. In this case 5-in. metal bands should be painted the proper color and clamped around the pipe at suitable intervals. All outlets, valves, tees, etc., should be coated.

As a further protection in the case of people who may be color blind, one leading plant authority has suggested that special geometrical symbols could well be used in addition to the basic colors. Words denoting the contents of the respective pipes, also could be painted on the solid color, as a further precaution.—F. C.

Sinclair & Valentine Co. Expand Coatings Division

President A. J. Math of Sinclair & Valentine Co., 611 W. 129th St., New York 27, N. Y., recently announced completion of plans for expansion of manufacturing, research and development facilities of the company's Protective Coatings Division.

Prominent in the printing and lithographic ink field since 1890, the company is also engaged in the production of primers, coatings, baking enamels, paints, varnishes, lacquers, and compounds designed to meet specialized requirements of the War and Navy Departments.

The Protective Coatings Division is under the technical direction of J. J. Donohue who has been associated with the company for the past ten years. Referring to the projected increase in research and development, Mr. Math said, "The demands of the postwar era for newer, better and more distinctive finishes and coatings will be linked with the outstanding advances in the field of plastics and synthetic resins."

The quality appearance that sells fine furniture is increasingly important in competition for new civilian markets. This is the time to apply the benefits of improved, modern finishes, to gain the advantages of eye appeal that sells.

Formulated to exacting requirements, Artisan Fine Finishes bring you those advantages. And American-Marietta technicians will be glad to work with you. They are practical in matters of sales appeal, customer satisfaction and production problems. Just phone or write.

AMERICAN-MARIETTA COMPANY

Marietta, Ohio Chicago, Illinois High Point, N. C.

A great name in paint making

MY EXPERIENCE IN FINISHING *Gum Furniture*

A peek into a finishing room that finishes Borax furniture, where the work includes filling holes and cracks, followed by a sealer coat, ground coat, printing of grain and finally a sealer coat plus a top coat.

BY J. C. LIVINGSTON

I AM CONVINCED that one of the most difficult tasks that confront a finishing room foreman is that of taking a piece of cheap borax* furniture made of gum, poplar, and perhaps half a dozen other cheap woods of possibly as many different colors and textures, and produce a finish that looks good, will stand up, and have the necessary eye appeal of "flash" to make it sell. Hence, this article on finishing this type of merchandise.

Flashy Grain Reproduction by Printing or Graining

It is a fairly simple thing for a finisher to take a fine piece of solid or veneered furniture in walnut, mahogany or some other expensive wood, and get a finish that looks good, but it is quite another thing to finish a piece such as I have designated above. I have used a number of different methods of "camouflage" in finishing this type of furniture, of which I will outline a few in this article.

The first of these methods is called printing or graining. There are several different methods of printing or graining in use today. All of them are practical and easy to use, once they are clearly understood. The method I finally adopted, after trying a number of them, is the one wherein we use a copper plate, into which the figure of the wood to be imitated or reproduced has been etched.

Some one or more concerns has perfected a power-driven graining machine to be used in connection with etched copper plates, and with this machine it is no trouble to get volume production. You can get as many different kinds of wood reproductions as you want by buying a different plate for each one desired and, with several of these plates, a finisher who has imagination and initiative can combine the various woods to make some really nice looking suites of cheap woods.

Treatment of Bent Work Such as Waterfall Tops

In finishing a suite with waterfall tops, it is necessary to do the graining before the tops are bent. I have grained tops after they were bent, by using a small roller and doing the work by hand, but it is very slow and it is almost impossible to get a perfectly uniform job. After the tops are grained they should be coated with a good grade of lacquer sealer and allowed to dry over night. Then they can be sanded and bent without harming them in the least. *(Continued on p. 94)*

* Borax furniture belongs to no particular period or style, but is overdressed with highly figured colorful veneers presented in flashy design and finished in high luster to satisfy people who believe "this is it" —and it does sell in large volume.

"You won't find any bugs in THAT polish, Digby! S-I-P's lab control gets 'em all out."

THAT'S RIGHT . . . THERE ARE NO "BUGS" IN

S-I-P Cleen-Up Polish

It's TROUBLE FREE because it's made under careful laboratory control . . . . the same as S-I-P WEAR MASTER FINISHES!

S-I-P CLEEN-UP POLISH saves time and labor, too . . . just "wipe it on and wipe it off". Whisks away finger marks, rubbing compound, lint, dust . . . leaves no scum or skin . . . contains no harmful solvents.

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FREE TRIAL

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Just clip this coupon to your letterhead and mail it to us for a generous free sample of S-I-P CLEEN-UP POLISH. No obligation.

EVANSVILLE 4, INDIANA

It is necessary in almost any case to have at least two plates, even though you want to grain only one suite and use the same grain on both the fronts and tops. The reason for this is that you will want the grain to run the long way of the panel on chifforobe doors, etc., while on drawer fronts, waterfall tops, base rails, etc., you will want the grain to run the short way, or across the panel. On suites that do not have waterfall tops you would, of course, want the grain to run the long way.

Inspect and Fill Holes and Cracks With Crack Filler

In a plant where any of this type of work is to be done, it is necessary to have a separate room where this preliminary work can be performed before assembly. The best place would probably be between the machine room and cabinet room. It will be necessary to have one or more spray booths and several racks, such as are used for mirror frames, in which to put the work for drying. A roller coater could be used for coating this type of work to a good advantage. It would save a lot of time and material.

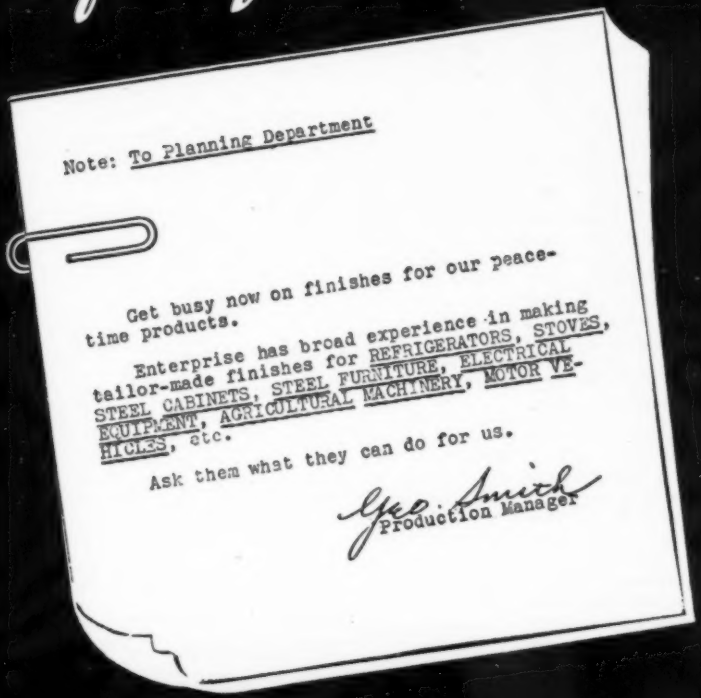
The first thing to do when the work comes into this room is to have a man inspect it and fill all holes and cracks with crack filler. For this work I use a water-soluble crack filler that comes in powder form. When using this crack filler care should be taken to fill the cracks and holes a little more than full to allow for shrinkage. These repaired pieces should be put in a rack to dry. When the crack filler is dry and hard these pieces should go back to the sanding department and be sanded level on the belt sander.

The work is now ready for the first coat, which is a lacquer sealer. This can be applied either with a roller coater or spray. After this sealer coat is dry, it is given a good sanding with No. 5/0 sandpaper. I use air-driven, protable reciprocating sanding machines for this work.

Ground Coat; Graining; Sealer Coat; Final Finish

Next comes the base or ground coat, which is a lacquer type of paint of the proper color to use in connection with the graining ink to produce the desired results. This material can also be applied with a roller-coater if it has been made for that purpose. It is a good idea to let your supplier of this material know if you want to apply it

Request from Production


Note: To Planning Department
Get busy now on finishes for our peace-time products.
Enterprise has broad experience in making tailor-made finishes for REFRIGERATORS, STOVES, STEEL CABINETS, STEEL FURNITURE, ELECTRICAL EQUIPMENT, AGRICULTURAL MACHINERY, MOTOR VEHICLES, etc.
Ask them what they can do for us.
Geo. Smith
Production Manager

Your Inquiry Will Be Given Prompt Attention

ENTERPRISE PAINT MFG. CO.

Industrial Division

PEORIA & VAN BUREN STS. CHICAGO, ILL.

with a roller-coater, so he can see to it that the material is made to dry slowly enough to be applied this way. As soon as this coat is dry you are ready to do the actual graining.

The manufacturer of graining equipment to be used will have a service man on the job to help you get started, and also to train your men to do the graining work. As soon as the graining is done, you are ready for the next sealer coat, as it does not harm the work in any way to apply the sealer as soon as the graining is done. The sealer coat should dry several hours, preferably over night, before the work is packed on trucks to go to the cabinet room. Later it enters the finishing room for final finishing.

Graining by the Stencil "Veneerite" Process

Another process we use on gum suites, is called "Veneerite". This is a patented process and will require permission from the patent owner before it can be used. However, there should be no difficulty in obtaining permission to use this process, as there are no strings attached, other than that you buy the stencils and finishing material from the patent owner. This work is done in much the same way as the printing work which I have just discussed.

The work comes into the graining room KD, on trucks, is inspected, and all cracks and holes are filled with crack filler. The sealer coat is omitted, and the work goes to the roller-coater or spray booth for the base coat of a light tan-colored lacquer. After this is dry, the parts to be finished in a darker color, such as butt walnut, etc., are given a coat of a dark walnut stipple stain, after which a rag is rolled over it to give it a dapple, or stippled effect. After the stipple has dried for a few minutes the work is taken to the shading spray for the first application of shading stain.

For this first operation a stencil with very wide stripes, cut out in the shape of a "V" or diamond, is used. This stencil is placed over the entire front of the piece to be finished, and a very light coat of a light pinkish-colored lacquer shading stain is sprayed on. This, of course, dries as fast as it is sprayed on, so you are immediately ready for the next operation.

For this you use a different stencil, which has very narrow stripes that are cut to fit the first ones made in the other stencil. This stencil is placed over the entire front, the same as the first, and a dark walnut-colored shading stain

QUALALACQ SPECIAL 866

ANOTHER QUALATONE PRODUCT

Qualalacq Special 866 is formulated to yield a high grade wood lacquer of the synthetic type which possesses a marked degree of penetration, smooth flow, accentuation, body, hardness, flexibility, balance, clarity, depth of tone, ease of application, and low cost. Its hardness is such to resist impact, press markings, average heat, water, 120 proof alcohol, and will not scratch white.

Qualalacq Special 866 is a naturally high gloss lacquer, but may be rubbed and polished to any desirable degree of gloss approximately twenty-four hours after the application of the final coat. Specific mention must be made of its excellent rubbing and polishing properties which make this lacquer suitable for high grade piano and cabinet finishing. A higher quality clear gloss wood lacquer is not obtainable at any price.

Write for your copy of "The Finish of your Lacquer Problems"

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is sprayed on fairly heavy. This also dries very fast, so that you are almost immediately ready to spray the sealer coat over the entire work. After this dries sufficiently, it is ready to be packed on trucks and sent to the cabinet room. The grained surfaces are coated later.

Coating ARMORED ELECTRIC Cables for Ships

BY HENRY NOVAK

THOUSANDS of feet of electric cables are used on board a ship for telephone and other communication; also for electric lighting and for operating machinery and other equipment throughout the ship. Practically all of these cables must be protected by paint.

These cables are in various sizes —in diameters ranging anywhere from ⅜-in. to 2½-in. Many of the cables are covered with armored bronze or with steel and aluminum; and then there are rubber-covered cables. The metal armor on a cable is solely to protect the cable from damage while the cable is being pulled during installation. Once the cable is pulled and installed, the braided armor has served its purpose.

Cable must be thoroughly coated with red lead on Maritime Commission ships, and with zinc chromate on Navy vessels. The coating is applied before the cables are installed, to insure a thorough protective coating of paint over the fine mesh because, once they are installed, the cables are placed closely against each other; hangers are fastened in position; the cables lay close to bulkheads and under deck-heads, and the runways are full of various size cables. It would be practically impossible to paint them afterward.

Tunnel Shaped Tank Developed in Emergency

At one shipbuilding plant a dip coating setup was devised quickly to paint these cables before installation. Three short sections of large diameter pipe were cut and welded together to form a tunnel-shaped tank which is open at both ends and which, when mounted in position, has a short upturned section at each end so it will hold paint. A crude memory sketch of the tank and its accessories is shown in the accompanying illustration. Rollers were put in to guide the cable and to force it low enough to pass through the shallow depth of paint in the tank. Also, an opening and covering for same were placed in the top, and an outlet drain was installed in the underside. Then the tank was mounted securely in horizontal position with its ends upturned. An inclined drainboard was placed at one end of the tunnel-shaped tank.

Operation was simple. A loaded

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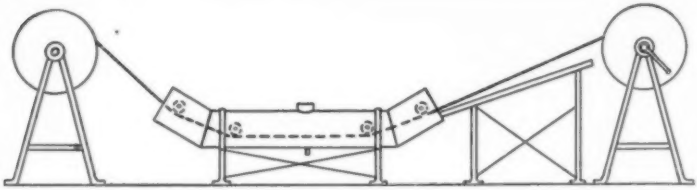

Crude sketch of our emergency setup for coating armored cable for ships.

reel of cable was mounted on a stand at one end and an empty reel was placed on a similar stand at the other end. The tunnel-shaped tank was partially filled with priming paint and the cable was passed through it and wound onto the empty reel.

A handle on the axle of the empty reel could be turned to pull the cable through the tank and wind it onto the empty reel. The excess primer fell onto a drain pan and flowed back into the tank. It required only a short time to coat the cables in this manner and it was approved by the resident Navy and Maritime Division's chief inspectors. Stiff bristle brushes could have been attached to the tank to remove excess paint. However, we thinned our primer considerably so that little excess paint clung to the cable as it left the tank, and this quickly drained off over the drain board.

Spray Equipment Would Have Worked Fine

We contemplated using automatic spraying equipment for coating these cables and probably would have installed such a setup if our 1944 wartime volume of this kind of work had not shown signs of being tapered off abruptly early this year. Several spray equipment manufacturers submitted photographs of coating machines. They are similar to those used for coating exteriors of pipes. Three spray guns are directed toward the cable, adjustments being made for different diameters of cable; and the paint is adjusted to give a full wet uniform coat. The cable is pulled by power from one reel to another, moving at speeds up to as much as 300-ft. per minute. The worm gear is used to guide the cable evenly from side to side as it goes onto the reel. Force drying could be used to partially set the primer — for instance, a bank of infra-red drying lamps. Thorough drying is not particularly necessary before reeling.

Color of Cable Coating Agrees With Color in Ships

In cargo spaces and other spaces where there are no living quarters, it is not necessary to coat the brass-armored cable, but to be on the safe side we coated all cables and we had no worries when electricians installed them throughout the ship. We coated all cable to conform to colors or areas of space in which it was to be installed.

Practically all of the cable on the Maritime ships receives only the prime coat, as most of the quarters are paneled and the cables are concealed behind panels. The Navy has no paneling in its ships, so all cables are exposed and easily accessible when or if trouble occurs, therefore these cables were given a coat of zinc chromate primer

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after installation, while workmen were spraying the surrounding steel surfaces. Then the cables were thoroughly sprayed with a fire retardant paint such as is used on the interiors of ships for a finish coat.

We primed hundreds of thousand of feet of cable with the simple dipping equipment described and illustrated in this article. It occurs to me that the same idea could be adapted, in emergencies, for various other jobs of coating or treating cable, wire, rope, etc.

Dr. N. W. Taylor Joins 3M Co.

Dr. Nelson W. Taylor has been appointed to the post of technical assistant to the director of research of the Minnesota Mining & Mfg. Co. In addition, he will also continue as head of the ceramics section.

Before coming to 3-M Company in November, 1943, Dr. Taylor was head of the ceramics section in Pennsylvania State College.

W. A. McKim Joins Roxalin

Mr. Walter A. McKim has joined the Roxalin organization where he will be active in the company's postwar technical sales development program.

Paint Spray Hose

A new catalog section on its paint spray hose, designed for spraying of lacquers and synthetic enamels has been published by the B. F. Goodrich Co., Akron, Ohio, and is now available upon request. Details of construction are outlined, together with data on sizes, braid type, weight per 100-ft., outside diameters and working pressures.

Protective Coatings Chapter

"Protective Coatings, Insulating Paints, etc.," is the heading of Chapter XIV of a 30-chapter, 300-page book called "Glycerin, Its Industrial and Commercial Applications," by Georgia Leffingwell, Ph.D., and M. A. Lesser, B.Sc. There are many other chapters of interest and value to readers who like to delve into what's back of many different products for many different purposes. The book can be supplied by INDUSTRIAL FINISHING Magazine. It is priced at $5.00.

Electrostatic Spraying Paper

Reprints of James B. Willis' article, "Electrostatic Spraying of Porcelain Enamels," as published in the Journal of The American Ceramic Society, in May, 1945, can be obtained by writing Pemco Corp., Baltimore 24, Md. The reprint covers more than 12 pages about 7½x10½-in. The author goes into the subject of electrostatic spraying rather thoroughly and brings out many points of interest which could apply to the spraying of organic finishes as well as porcelain enamels.

Pierce & Stevens, Inc. Transfers J. H. Dodds

Due to the increased distribution of its products in the Middle West, Pierce & Stevens, Inc., Buffalo, N. Y., has transferred Mr. James H. Dodds to Chicago, Ill., where he will be associated with Mr. R. S. Inglehart, sales representative of the same company. In addition to the Chicago area, Mr. Dodds' sales activities will include

James H. Dodds will assist in the sale of Pierce & Stevens products in Middle West, working out of Chicago, Ill.

trade contacts in Wisconsin, Indiana and Ohio to supplement the existing sales service at these points.

Mr. Dodds joined the sales department of Pierce & Stevens, Inc., in 1936. In 1942, after having served as sales engineer in New York State and Pennsylvania, he enlisted in the U. S. Army Air Force, which he served for a period of more than two years as flight instructor. Upon his honorable discharge in 1944, he returned to Pierce & Stevens, Inc.

Among the products manufactured by Pierce & Stevens, Inc., are lacquers and allied protective coatings, adhesives, emulsions, laminating and impregnating compounds, thinners, enamel reducers, cleaners and special solvent blends.

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Questions and Answers

Painting and Labeling Shanks of Drill Bits

We are seeking help on some marking and labeling problems. We manufacture and distribute, through industrial supply distributors, a line of carbide tools such as drills, reamers, etc.

We want to make these tools as attractive as possible from a sales standpoint. We will appreciate your courtesy in sending sample copies of your publication, in order that we might better order subscriptions to this magazine for the use of our production department.

We plan to paint the shanks of our tools and then to apply some sort of label, carrying out a special color scheme and also giving tool use data. Your help will be greatly appreciated.—S. S. Co.

The usual difficulty in a problem of this kind is the number of sizes involved; that is, the tool cost or workholders become prohibitive for volume per size. It is usually desirable to hold a uniform sharp line between the painted and unpainted surfaces. A full automatic spray machine requires several hundred workholders for each size and type.

In my opinion roller coating is next to impossible, or it presents very little advantage over dipping, if as satisfactory. Dipping of an article usually does not give a perfectly uniform decorative finish. It is presumed that anything but a first-class finish would defeat the purpose.

Dipping could be accomplished with a double chain cross-bar type of workholder. The workholder could be adapted to many sizes of shanks. The coated parts could be loaded and unloaded in various multiples rapidly from a spacing fixture. They would be conveyed through a constant level tank. It is very doubtful if the desired results could be accomplished except with the use of the electrostatic detearing process after the dip and drain.

The parts could continue through a drying oven and then through a cooling area to complete the base coating. In order to complete a production machine of this type a predip of a hot phosphoric acid solution should be provided in advance of the enamel dip.

A practical method for coating a lesser number of various sizes would be a 2-spindle semi-automatic rotating spray machine. Trays could be designed to hold a quantity of various sizes with a clamp arrangement. The trays could be turned upside down for the hot phosphoric acid dip or other preparation of the metal.

A 2-spindle spray machine would only require four accurate workholders, which would also mask the part not coated. These spindles would be made of tubes with pins inside to partially eject the work for handling. This would be actuated by a simple air cylinder. The operator would fasten two of the proper workholders to the two spindles. She would pick out of the

a few words from Santocel to manufacturers

of lacquers synthetics varnishes

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Meanwhile, if you would like to investigate Santocel for future use, write for technical bulletin, telling us whether you are interested in synthetic resin and oleoresinous varnishes, lacquers, or printing inks. Address: MONSANTO CHEMICAL COMPANY, Merrimac Division, Everett Station, Boston 49, Massachusetts.

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tray two drills, one in each hand, and place them in the workholder. By pressing a foot lever, a clutch would engage the parts and spin them while the spray guns operated. The partial ejection of the drill could be with another foot lever or by delayed action on the same lever. This would all be accomplished by simple standard air valve equipment. The object of ejection is to provide an unpainted surface for the girl to take hold of the work.

The coated parts in the trays could either air dry or be pushed into some form of heat application.

It is believed that a girl could coat approximately 40 parts per minute by this method. The tool or workholder cost would be only four for a size. This is for the cleaning of two while the others are in use.

A special printing press manufacturer could make a small printing press for the lettering work. This would require very little labor and probably would be less expensive than decalcomanias. The decalcomanias would be less in first cost, of course. They could be made in tape form and applied in a similar manner to packaging tape.—BYRON MORRILL (Morrill & Renshaw, Finishing Engineers).

There are special problems to contend with in painting the shanks of drill bits because of the smooth hard surface, and the tendency for any paint coating to chip from such surfaces.

To prepare the surface for painting, a phosphoric acid dip (such as Metalprep, etc.), would be very beneficial. Of course, only the part to be painted should be dipped, as the phosphoric acid etches and removes the high polish of the metal.

I believe the most satisfactory finish for the purpose would be one with the highest adhesion and flexibility and with a low solid content. The thinner the final film, the more satisfactory the results. The ——— Co. made a very good lacquer for this purpose.

It may be that the color scheme can be accomplished with decals, allowing one standard base coat, but because color identification of the different types of tools is so beneficial it probably would be better to color the whole shank.

A possible alternative to using decals for tool use data would be the acid printing method; but this could not be used on the area that is to be painted.—JAMES A. BEDE.

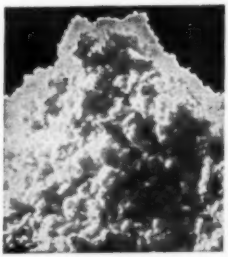
It seems to me that the diversity in the shapes of their products, and the possibility that their production might not be large, are probably the things that make theirs a confusing problem. They have no doubt submitted their problem to equipment builders and do not feel justified in spending the money required.

If it were possible to get an idea of the various shapes, dimensions, and quantities of each item to be processed, practical suggestions could be made as to the type of equipment required to do the job. —H. R. MADSON, Ind. Consultant.

Naphtha Causes Skin Trouble

For the past 15 or 20 years, men working in our finishing room have been troubled with an outbreaking or rash under the armpits, around the waist, and on the arms. Our local doctors have diagnosed this trouble as gasoline poisoning. Their analysis is undoubtedly correct, as rash-affected operators taken off jobs using

We found a simple solution by surfacing with FLOCK



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Developers and Manufacturers of Printing and Coating Flock

VMP naphtha, such as is required in filler or gas-oil rubbing, will invariably clear up within a few weeks.

We wonder what experience any other wood finishing company may have had in regard to this, and would like to know about any cure that they have used.

We would also be interested in knowing if there is any other agent similar to naphtha which would not have the poisoning effect on the user. We have tried several types of skin creams but have not found these to be of any value in preventing the outbreaking of rash.—K. FURN. CO.

One of our friends reports of having experienced this same trouble in his furniture finishnig department. He says it comes from the men washing their hands in straight naphtha. Accordingly he adds linseed oil (one part linseed oil to 10 parts naphtha) to the naphtha that his men use for washing their hands. He declares that this stopped the skin rash trouble among his finishers.

If or when naphtha vapor or gasoline fumes cause any trouble, the remedy would probably be to install ventilating equipment to remove the vapors.—ED.

To Obliterate Grain of Fir Plywood

We would appreciate information regarding the finishing of cabinets of Douglas fir plywood. At present we are using a sealer coat followed by three coats of primer, with sanding after each coat. The final finish is a rubber black lacquer.

Can you suggest any time-saving operations in connection with this work? Please note that it is desirable to cover and finish this wood so that no grain will show through on the finished product.—U. C. Co.

To obliterate the grain of fir plywood so that you can have a painted surface as smooth as clean sheet metal, is no easy or quick operation. At any rate, we know of no easy quick way to do it. Quoting an experienced finisher's reply to a similar question published in a previous issue of INDUSTRIAL FINISHING:

"Taking into consideration the natural alternate very soft and very hard layers of grain that must be overcome in finishing fir wood, and still keeping an eye on excessive production costs, I have found a method that in my opinion is the most economical.

"First, instead of f i l l i n g the grain with filler or undercoater, which has a natural tendency to lift the grain, I have found that if you shoot the bare surface with a fog coat of shellac diluted 50/50 with alcohol, you can save a lot of labor and material. When shooting the fog coat, hold your spray gun about 12-in. away from the work, so that the fog coat is applied somewhat dry. By not shooting wet and not piling the shellac on, you will lift the grain only slightly. When the fog coat is thoroughly dry, sand lightly to remove any slight fuzz. Remember, shellac is deceiving; it may appear to be dry and yet require much more drying time.

"The second coat of shellac need not be diluted quite as much as the first; use about one-third thinner. If the shellac fog coats are applied correctly and a l l o w e d plenty of time to dry, very little surfacer will be necessary.

"If there are any hammer marks

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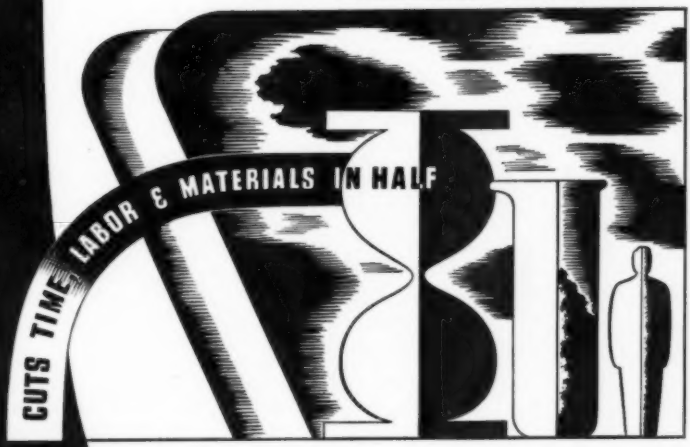

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*Trade Mark Carbide and Carbon Chemicals Corporation

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or dents in the plywood they can now be glazed with a stiff glazing compound. Avoid thin glazing compounds because they shrink when drying. The surfacer should be applied one light coat over another until you are positive that it can be sanded without going through to the bare wood. Should you accidently sand through to the wood in spots, it will be necessary to again seal with shellac and resurface the spots. Otherwise the grain will lift every time a coat is applied.

"Let me emphasize that the most important operation is sealing the bare wood properly. And when it is once sealed, keep it sealed.

"Before applying the final finish coat, the surfacer should be sealed. To apply the final finish, shoot a fog of color; then, when it is thoroughly tacky, shoot a slow heavy wet color coat."

How to Agitate Your Pickling Solution

I have been very much interested in reading "L. J.'s" article, "Agitate Pickling Solution", on page 60 of May 1945 INDUSTRIAL FINISHING. In some instances air causes bubbles to form in the solution, these bubbles in turn adhering to the work and preventing the necessary intimate contact between solution and metal, and resulting in spotty and imperfect cleansing of the surface.

Likewise, use of steam introduces water into the solution, rapidly lowering the concentration by virtue of the condensation trapped in the bath or, if the steam be used in sufficient quantity, the bath is over-heated and excessive evaporation takes place, again changing the concentration of the bath.

Where I've had to use pickling baths, I've found that the use of a small pump, which utilizes a small volume of the fluid and jets it through a vat as a stirrer, is most uniformily effective. This recourse, of course, necessitates a pump and jet system which will withstand the pickling solution, but such equipment is readily available, and will quickly pay out in more uniform bath conditions. If the material to be cleaned changes the bath temperature beyond a desirable range, the flow between pump and jets may be passed through exchanger coils—likewise of metals or materials resistant to the solution—and the desired temperature can be maintained.—ELTON STERRETT.

Phosphate Coating for Metal

In one of the Government's specifications for finishing metal products, they specify: "shall be finished on the inside and outside with one coat of suitable phasphate treatment". This specification was recently revised and now reads, "shall be thoroughly cleaned and painted inside and outside with one coat of suitable phosphate treatment".

There has been a great deal of discussion as to what is technically meant by "phosphate treatment". Up to now, it was our impression that it was a plating process similar to bonderizing or parkerizing.

The revised specification indicating that this treatment is to be painted on, raised the question whether or not it is a plating process or a painting process.—L. I. R.

The phosphate treatment or coating for iron and steel surfaces is a chemical conditioning of those surfaces before painting, to give

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the paint a better bond or better adhesion to the metal. In Jerome M. Bialosky's excellent article, "Rust Resistant Coatings for Steel Products", which appeared in September 1944 issue of this magazine, the following paragraphs deal specifically with phosphate coatings:

Although black steel is the chief metal treated before coating, treatments have also been applied to galvanized and cadmium-plated steel with excellent results. The most widely used surface treatments are based on phosphoric acid or metal hydrogen phosphates, although oxalates and chromate-base materials have been developed.

The result of the surface treatment is to convert the steel surface into an insoluble insulating film which will retard corrosion and offer a good "tooth" for paint adhesion. The phosphate treatment produces an insoluble crystaline-coating on the steel surface, which meets these requirements.

What Phosphate Coating Does; Methods of Application

It should be noted here that a phosphate coating, by itself, is of little value. *Its value lies in its ability to improve the service life of the finish applied over it.* There are three methods of obtaining phosphate coatings. The choice of method depends on the size and shape of the work, and the conditions existing in the user's plant.

The first method is the dip process. It is widely used for a great variety of shapes and sizes of work. This method has been adapted for use with tumbling barrels, for treatment of small parts such as nuts and bolts.

The second method is a spray or flow-coating operation in which the phosphate solutions are sprayed on the work in a manner similar to what is used in a power washer. It is frequently included as the final operation in a multiple-stage washing machine.

The third method of obtaining phosphate coatings is to brush or wipe the surfaces with suitable solutions. This method can be applied to structures that are too large to handle in the previously described methods. It can't be used in the field on steel structures, bridges, trucks, and for similar applications. Stock that has rusted due to improper handling or storage can be readily reconditioned by this method.

It is obvious that these different applications will require different formulations for the dip, spray, wipe or brush treatments. Some of these materials may be applied and allowed to dry on the surface, while others require rinsing—and in some cases a chromic acid rinse is recommended. The supplier's instructions should be followed exactly.

Metal Must Be Cleaned Before Being Coated

Prior to the application of any coating treatment it is essential to remove all grease, oil, drawing compounds and dirt from the metal surfaces. Although the surface treating compounds are acidic in nature and will remove rust, unless specifically designed for this purpose it is more economical to remove heavy mill scale by an acid pickle.

Following this precleaning, the phosphate solutions are applied for the time and temperature recommended by the manufacturer. After rinsing and drying, the organic coating should be applied as soon as possible. Complete instructions regarding the testing and maintenance of the solutions are available from the manufacturers and should

What does it signify that one of every ten Pratt & Lambert employes gives his full time to laboratory work on paints, varnishes and lacquers?

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be followed for continuous satisfaction.

Two types of phosphate treatment are available. The first type is primarily a base for paints. The preceding discussion has covered this type of treatment. The other treatment is a dip operation. It requires longer immersion time and produces a heavier, more absorbent surface. This treated surface is always waxed or oiled to obtain corrosion and wear resistance.

A number of Government specifications for metal parts require phosphate pretreatment. These include the specification covering the cleaning of aircraft metal surfaces prior to the application of an initial protective coating (Army Specification No. 98-20007); also, the general specification for finishing, treating and painting (Corps of Eng'nr's Spec. T1184E).

Other surface treatments—later developments—are rated by many authorities as being improvements over the regular phosphate coating, so when or if you have any choice in how to prepare your own or your customers' products for protective or decorative paint coatings, we suggest that you investigate them. In a letter we are suggesting names of firms who can probably furnish materials for such coatings and complete information about them.—ED.

One-Story Factories Are More Desirable

POSTWAR PLANTS should be constructed with an eye and ear toward the lessons learned in modern warfare, in the opinion of a New York industrial consultant.

Francis Chilson, plant consultant for a number of the country's leading industries, urged this precaution in a speech prepared for an Eastern Manufacturers Association Committee on Production.

"European bombing photographs clearly show that multi-story structures went down," Chilson reminded. "The one-story plant had to be hit almost in its entirety before it was out of business. That's a good lesson to remember even in peacetime. Physical breakdowns in the one-story plant can be isolated and restored with much greater facility than in the multi-story operation. Bottlenecks can be bypassed or liquidated more readily. Generally speaking, down time is in direct ratio to the number of floors in a factory.

"Plants should be designed solely for operating efficiency and not as architectural monuments. The one-story plant can be both, if desired. You can, in short, do anything in a single-floor building that can be done in any other. And such a building is cheap to build, easy to maintain and inexpensive to operate.

"Ground is still the cheapest investment in America."

Book on Plastics

Here is an up-to-date and comprehensive book covering the scientific and technological aspects of the ever-growing plastics industry. It comprises a critical survey of the literature and a correlation of scattered data which will be of value both to chemists of the plastics industry and to the practical man whose work requires knowledge of the chemistry and technology of plastics. The book is also ideally suited as a text for college courses on the science of pastics. Description of reactions and details of procedure will be valuable in conducting plastic research, whether this is carried out in a college or an industrial laboratory.

The author of this new book, "Plastics—Scientific and Technological," is H. Ronald Fleck. Copies can be obtained through INDUSTRIAL FINISHING Magazine. Price is $6.50.

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Time and again, customers have told us they'd lost hope of finding a desired finish — until they found us! Our files have proved an unfailing source for many manufacturers. It may well hold the answer to your problem. If not, there's our research laboratory — with a high score for bulls'-eyes.
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Materials Supplies Equipment

Electric Marker

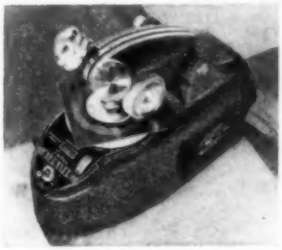
Anything and everything can be marked with the new Electric Marker recently announced by the Ideal Commutator Dresser Co., 2030 Park Ave., Sycamore, Ill. The tool is only 6-in. long and it weighs 10-oz., but tests prove that this new marker can be used continuously on the toughest of marking jobs.

Using an entirely new principle in design, the power of the cutting stroke has been increased by 30% over previous models. An adjusting nut makes it possible to vary the impact so that it can be used to mark on glass. Shaped to fit the hand, it can be held and used to write almost as easily as a pencil.

The Ideal Marker operates from any AC electrical outlet. Operating like a small electric hammer, it makes 7200 cutting strokes per minute, cutting right into the surface, leaving lines that cannot be wiped away or worn off with ordinary usage. Permanently marks sizes, names, numbers and other important information on tools, parts and finished products. Marks iron, steel, bronze, aluminum, ceramics, tile, marble, lead, plastics, porcelain, glass, etc.

For Testing Abrasion Resistance

For testing the abrasion, rubbing or wear resistance of finish coatings, a complete testing set is available. These products are made and sold by Taber Instrument Co., North Tonawanda, N. Y.



A useful testing device.

The testing set includes a Taber abraser, with all accessories, together with a specimen table for running tests under wet or moist conditions. An illuminated magnifier for the inspection and examination of specimens is included.

The Taber Abraser is self-contained and ready to operate by simply plugging into an electric line. The results of tests are reported either as the number of "Wear Cycles" or as "Loss in Weight" when weighed on a precision laboratory balance.

Respirator Filters Out Vapors

A new, officially approved M. S. A. Chemical Cartridge Respirator, designed for protection against low concentrations of organic vapors, is announced by Mine Safety Appliances Co., Pittsburgh, Penna.

Approved by the U. S. Bureau of Mines under its newly established Schedule 23, this M. S. A. respi-

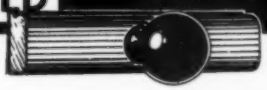
AGAIN IT'S ALAKA *This time with*

ALAKA FUNGICIDAL LACQUER No. 8447

CONFORMS TO SIGNAL CORPS

TENTATIVE SPECIFICATION No. 71-2202-A AND ARMY-NAVY TENTATIVE SPEC. No. JAN-C-173

APPROVED



MILDEW RESISTANCE

In tests against mildew at 25° C to 27° C a 1/4 inch zone of inhibition was successfully proven per photo above.

HIGH DIELECTRIC STRENGTH

Dielectric strength with results expressed in volts per mil of 60 cycles.

	ALAKA 8447	SIGNAL CORPS REQUIREMENTS
Dry.....	800	500
Wet: After 24 hrs. immersion	349	250

HEAVY VISCOSITY

Can be thinned with Alaka Thinner, 1 part Thinner to 2 parts Lacquer.

RESISTS SALT WATER

without any effect after several days of immersion.

RESISTS THERMAL SHOCK

and subsequently bends without cracking.

Fungus control becomes increasingly important as the War Scene shifts to the Pacific Area. Be Prepared! Write now.

Send for your copy

Write us on your letterhead and we will send you a copy of our new, complete, up to the minute catalogue of U. S. Government Specification Finishes.

TAKE IT TO ALAKA

Custom Tailored Finishes
TO FIT YOUR REQUIREMENTS

ALAKA

LACQUER & CHEMICAL CORPORATION — 220 FORTIETH ST., BROOKLYN 32, N.Y.

It has replaceable filter cartridges.

rator provides protection against vapors in concentrations up to 1000 parts per million of such substances as acetone, alcohol, benzene, carbon tetrochloride, ether, formaldehyde, gasoline and petroleum distillates, and toluene.

A floating-cushion flexible facepiece, with a soft rolled-edge forming a wide area of contact, is a new feature. This assures a quick, gas-tight fit on persons of widely varying facial shapes and sizes. A nose strap provides automatic adjustment of facepiece across the nose.

Equipped with twin, replaceable, all-metal filter cartridges designed for high efficiency, the new respirator assures comfort, low breathing resistance and a balanced, easy fit. A new-type, guarded exhalation valve provides extremely low resistance to exhalation. Simplicity of cleaning and maintenance are additional outstanding features.

Skin Protection for Workers

Made to conform to the one type recommended by the United States Public Health Service as being most efficient for skin protection against oils and solvents, the entirely new, and radically different skin-protector compound, Sealskin, has been released to industrial and other workers in general, by Cadet Laboratories, Worcester 5, Mass.

Sealskin has been thoroughly tested, approved and endorsed, by Public Health and Safety Agencies, Compensation Insurance Companies, Safety Engineers, Medical men and Dermatologists, and is used extensively in industrial plants as protection against occupational infection caused by workers coming in contact with petroleum products and coal-tar derivatives, chlorinated hydro-carbon, acids, alkalis, caustics, degreasing compounds, and other solutions.

It may be applied over the most tender skin, on hands, face or other parts of the body subject to infection, safely even over broken skin, as it is both non-irritating and non-sensitizing. Placed in the nostrils it protects the membrane against fumes, sprays, dusts, powders and other irritants.

Sealskin, applied but once daily, forms a durable invisible waterproof coating over the skin that acts as a preventive against infection and from which most dyes, stains, dirts and grime may be washed with soap and water without its removing the protective coating.

Color Glue-Coatings for Plastics

The Krieger Color & Chemical Co., 6531 Santa Monica Blvd., Hollywood 38, Calif., announces the commercial development of a new important material called "Kriege-O-Dip Color Glue." This new product is used with excellent results where laminating or bonding plastics and color together is desired.

"Call on Walker"

Eliminate Your

Product Finishing Worries!

Put your problems up to us! We can be of assistance to you in solving your finishing problems just as we have helped others, by supplying the correct finishes.

Back of the Walker line of protective and decorative finishes for metal, wood, plastic and composition surfaces, is the vast amount of past experience which is now available to all customers. Write us about . . .

Primers **Surfacers** **Lacquers**
Synthetics
Wrinkles **Special Coatings**

Protective and Decorative Coatings for Metal, Wood, Plastic, Etc.

H. V. WALKER CO.
Elizabeth, New Jersey
MODERN PRODUCTION FINISHES

Color glue can be used in painting the surface of Lucite, Plexiglas, and Cellulose Acetate. It is also used where a simulated "shell effect" on handles of plastic compacts is desired. The brown color glue can be painted over the surface of the plastic, giving more pressure in certain areas and less in others. The glue dries in seconds, thus making its use speedy and most effective.

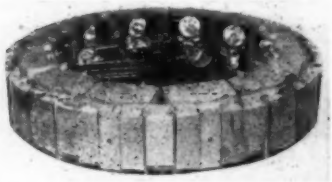
Another shell effect can be obtained by first dyeing the plastic in the standard "Kriegr-O-Dip" liquid dyes, either amber or yellow, and then painting the brown color glue over the dyed surfaces.

Once applied, it has the appearance of being an actual part of the plastic. Color glue gives a smooth surface wherever it is used. It can be thinned with ethylene-di-chloride, to make pastel shades, and thickened with Lucite or Plexiglas sawdust.

Infra-Red "Tub" Oven

Primarily designed for the small shop or occasional user, as an accessory to a spray booth when no conveyor is available, the infra-red "Tub" is offered for processing work that is not moving while being baked. The height of a single "tub" or story, is 11-in., two stories, 22-in., and three stories, 33-in. Each story is made up of a "ring" of standard Miskella units and each "Tub" contains one or more stories.

A switch is provided for each pair of lamps. This equipment is manufactured and sold by Infra-Red Engineers & Designers, 1633 E. 40th St., Cleveland 3, Ohio.



Four typewriters in "Tub" Model 612.

New Chemical Improves Ethyl Cellulose

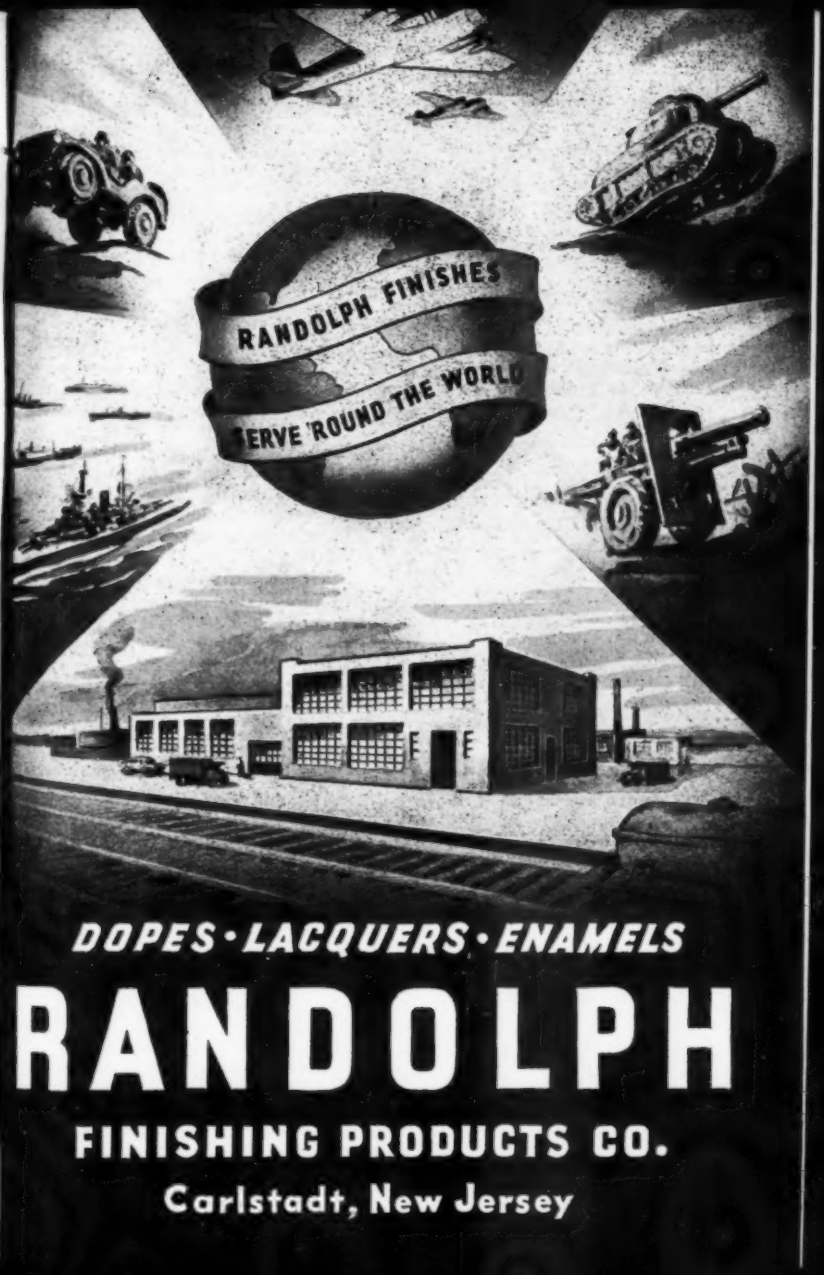
Menthylphenol, a new chemical which improves the heat and light stability of ethyl cellulose plastics, film, plastic peel, adhesives and paper coatings, is now commercially available, according to an announcement by Hercules Powder Co.

The chemical is a terpene hydrocarbon derivative and is another result of the extensive research in terpene chemicals being carried on by Hercules. Menthylphenol is a white opaque semiamorphous solid and can also be used as a plasticizer extender with cellulose acetate.

Research data shows that menthylphenol, formerly known as Stabilizer X, is outstanding in preventing ethyl cellulose plastics from becoming brittle and at the same time greatly minimizing the change of color of moldings.

Ethyl cellulose film containing menthylphenol possessed greater flexibility and considerably less surface cracking after exposure tests than film without stabilizer. The films were subjected to 60 days of outdoor summer exposure at Wilmington, Del.

The optimum amount of menthylphenol found useful with ethyl cellulose is 1% to 3%, based on total solids of the mix. Amounts less than 1% do not have sufficient stabilizing effect, and amounts greater than 3% do not appear to give any appreciable increase in stability.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Carlstadt, New Jersey

Industrial FINISHING

Distributed monthly to finishing room and paint shop foremen, production superintendents and company officials of metal-working, woodworking and miscellaneous industrial plants where production cleaning and finishing are major operations in parts and products manufacture.

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Editorial

Accurate Measurement of Paint Coatings

For many years, the industrial finisher has been wedded to a "rule of thumb" philosophy in his technical thinking. More specifically, he has had to depend largely on a sense of "feel" in the specification, testing and application of finishes. Training new operators has been largely a matter of letting them go through a period of trial and error until they had acquired the judgment and nicety of touch that is so much a part of the craftsman's equipment. As a result, it has been difficult to mechanize many finishing jobs completely.

Where it has been absolutely necessary to rigidly control finish thickness, drying and spraying time and other factors, finishers up until recently have been at a loss for a consistently accurate means of measuring variables. With the coming of what may be called the *Age of Measurement*, however, an end to hit-or-miss operation seems to be in sight. The net result should be better finishes in a shorter time and with less rejects.

Two fairly recent developments prompt this observation. First, there is now on the market a film-thickness gage which takes all of the guesswork out of this important testing operation. It will measure any non-magnetic coating on steel or iron without destroying or injuring the continuity of the coating. It is said to provide a rational basis for determining finishing material costs, reduce chipping or flaking which results from over-heavy coatings, and speed up production testing. Its most important feature, however, is that it provides an accurate testing tool, a measuring instrument where none existed before.

Another device which is coming into greater use today, is the recording spectrophotometer. Always a sadly misunderstood and poorly handled job, the measurement and recording of color is given a tremendous boost by this invention. Independently of human judgment, the spectrophotometer shows with mathematical precision whether

FINE Lines
DESERVE
A FINE FINISH
You have undoubtedly worked hard to create a product that has a trim, well-designed appearance in addition to its functional value. Have you considered equally thoroughly the type of finish you are using on that product? Finish can do a real selling job — subtly emphasizing good lines . . . presenting an attractive surface that catches the eye . . . making your product look just a little different, a little better. If you are not completely satisfied with the finish you are using now, our Creative Studio will be glad to help you discover the one that is best suited to your merchandise.

Your inquiry will receive our prompt attention

No Tampering with Quality

ROCKFORD VARNISH *Company*
ROCKFORD, ILLINOIS

Manufacturers of Protective and Decorative Coatings

two colors are identical, even taking into account the degree of gloss in a finish. Moreover, this amazing instrument indicates how divergent are two colors, so that correction can be accurately made.

True, this last tool, because of its complex nature, is not yet in a position to be used by the average industrial finisher. However, it does mark the beginning of a trend which, it is to be hoped, will lead to an era when industrial finishing will benefit fully from precise measurement of unknown factors.

A Failure—Success Story on Finishing

The superintendent of a finishing department recently had occasion to call in the sales representative of a paint manufacturer to discuss a new finish. An arrangement was made and the new material went into production. A week later, an irate superintendent called the salesman to complain of poor adhesion of the finish.

The paint salesman, quite humanly, blamed the cleaning material then being used. A call to the cleaning material salesman produced a like result: The finish was at fault. Finally, the finishing superintendent called in both paint and cleaner salesmen and the three of them went over the problem together. As a matter of fact, all three of them were at fault.

Not knowing too much about the finish that was to be applied, the cleaner salesman recommended a material which he thought would be adequate, closed the sale and waited for results. The paint salesman, also in the dark, went along with the available cleaner. But the most serious error was made by the user of the materials.

Purchasing from two independent supply sources, the superintendent neglected to insure a meeting of minds on two intimately related operations—surface preparation and actual finishing. Had he held a brief but thorough meeting with both paint salesman and cleaner salesman, he would have secured sounder recommendations based on a complete understanding of finish requirements.

Both paint and cleaning material salesmen have much in common. Their objectives are ultimately the same—satisfactory performance of their respective materials. They can accomplish much more if they are permitted to confer simultaneously. It is strongly suggested that finishers have them both in for discussions at the very beginning of a problem or new project. Much grief should be avoided in the later stages.

Key Men Losses in Industry

★ A great loss to the modern manufacturer is the turnover or quitting rate of employees in key positions, men who have spent many years—most of them in one particular plant—in the finishing end of the business. This loss is not directly noticeable on the books of the company, but is there nevertheless.

For example, a young man enters a new field—your particular one—and after applying himself diligently, at your expense, puts in 15

★ Guest Editorial . . . Many readers can write an excellent editorial—two or three paragraphs that present a timely suggestion or valuable idea which will stimulate real thought on a live subject. The Editor welcomes guest editorials and pays for those that are published.

DEPEND ON PEDIGREE FINISHES FOR EVERY REQUIREMENT

Write for Details

Whatever your particular problem on product finishing . . . postwar or current . . . you may rely on the performance of these outstanding finishes. Baking or air-drying . . . for spraying, dipping or brushing . . . appropriate colors. Send for FREE 24-page book, "Pedigree Products."

The PRODUCT WITH A PEDIGREE — THE P·D·GEORGE CO.

THE P. D. GEORGE CO.

SAINT LOUIS, U. S. A.

or 18 years, during which time he reaches a peak of familiarity with your products. His efficiency is finally paying off in more profits for you. At this stage he looks around and asks himself: "What am I getting out of my efforts?"

While he has been growing up and advancing the hard way, have you hired outsiders who are unfamiliar with your product, but who you are paying a higher wage and giving better working conditions than he is getting? Has his presence been taken for granted and have the opportunities for advancement been given to others? How much money did you invest in this key man to bring him up? Then why neglect him or let him quit? Is it possible that you were on trial during his formulative years and that you failed him? Think it over! Hold onto your key men.—A KEY MAN.

Classes in Practical Finishes Are Started

★ Everyone who has anything to do with the preparation of surfaces for finishing, the application of paint, varnish or lacquer coatings, and the accelerated drying of same, will be glad to learn that the importance of specific training for this type of work has been recognized and that classes have actually started in some schools.

One class was started in February 1945, at the University of Buffalo in Buffalo, N. Y. Here, the lessons are designed to give factual information that will enable students to know how to wisely select the better kinds of finishing materials and to handle them to the best advantage in their own manufacturing processes.

The classes are *for plant foremen and their assistants only*, and are held one night a week for 16 weeks. Students have entered from local plants engaged mostly in war work. The knowledge they have obtained is of immense help in this work and will be equally valuable when these plants swing back to civilian production.

The class is in charge of Richard B. Mather, assistant sales manager of Pratt and Lambert, Inc., of Buffalo. Regarding the class, Mr. Mather says: "We are teaching these men to apply scientific and engineering principles to finishing problems; emphasizing all of the various factors which a finishing foreman should take into account when deciding upon the kind of material he shall use and what finishing schedule he shall set up."

The lessons are divided into eight sequences, some of which are also sub-divided. For example:

1) How to analyze and solve finishing problems.

2) Teaching surface preparation for both wood and metal.

3) An alternate study of varnish, enamel and lacquer systems; also novelty finishes and their effects. The basic outline of this will be a definition of each system, for example, what is a varnish? Included is a brief description of the ingredients of each material and properties they impart to a finish; and a complete classification of each product by its composition, use and application.

Complete exhibits of all finishing systems are studied, showing:

A) Application techniques; hand tools, all manual processes, mechanical devices, etc.

B) Spray equipment and techniques; guidance in selecting the correct types of equipment; also demonstrations on handling spray guns. *(Continued on page 128)*

Get These Specialized Production Finishes

Without Priority or End Use

Gloss and Rubber Finish Black Baking Japans

These economical finishes for metal cover more units per gallon than many specialty and synthetic finishes. Easy to apply, they wear well, and their cost is moderate. Get Hilo Bulletin #1—Black Enamels and Japans; then send for samples of the Blacks you'd like to try.

#916 Black Crystal

A sparkling finish in one coat . . . on any hard non-porous surface! That's the performance of this crystal. Tough, waterproof, and oil-proof, it will cover 350 square feet per gallon. Compare this covering with that of other non-smooth Specialty Finishes. Write for Hilo Bulletin #8 and a free sample of #916 Black Crystal.

HILO

HILO VARNISH CORPORATION

42-60 Stewart Avenue, Brooklyn 6, N. Y.

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4) Mechanical equipment which will deal with:

A) A thorough discussion on wholly automatic spray-painting equipment.

B) A description of various kinds of washing and degreasing machines; factors necessary in properly selecting machines.

C) Conveyor systems and dipping tanks.

D) Baking ovens of all types.

5) Qualitative control.

A) Teaching the finishers themselves to have an insight into what a first rate manufacturer does to assure a high uniform quality.

B) Practical suggestions on handling materials so that a high quality may be maintained with uniform finishing results. Demonstrations of what using the right and wrong kinds of materials can mean.

6) Diagnosis of finishing troubles; finishers are taught to combat difficulties by recognizing their causes and knowing their cure or prevention.

7) Salvaging rejects; foremen learn "touch-up" techniques and how quickly and economically to repair articles damaged in finishing processes.

8) Value and limitation of material specifications.

This course, in covering every phase of modern finishing work, gives each student a concise, practical knowledge which may be applied in any way that conditions may demand. Foremen from several plants have expressed themselves enthusiastically over the knowledge they have already gained. They have met and solved difficulties which would have been impossible for them to have handled previously. The firms where these men are employed are also watching and are well satisfied with the results.

It is to be hoped that universities, colleges and technical schools in other parts of the country will start and carry along courses of this kind.—E. WELLER.

A fire extinguisher can be useless if it is located where precious seconds are lost in getting to it, and back to the fire.

Letters From I. F. Readers

(Continued from page 12)

signers for Industry, Inc., and we suggest that your reader may welcome an opportunity to inquire into our capacities. A unique virtue of our organization is its diverse talents which bring to our clients a well balanced aid in handling many problems.—DESIGNERS FOR INDUSTRY, INC.

Who Does Flock Coating?

We understand there is a concern in Indiana that makes a specialty of decorative flock coating on paper and fabrics, using the electrostatic process. We prefer to have this work done by this process because of the higher pile and uniformity of coating. Can you give us the name of that concern and also information as to their size and responsibility.—N. Co.

We know of no concern that does the decorative flock coating you mention. The Harper J. Ransburg Co. of Indianapolis, manufactures and installs electrostatic spraying equipment. —ED.

Electrostatic Information

Attached to our engineering and sheet metal section is a newly opened department known as Industrial Painters. We have installed the most modern equipment for handling painting problems in Sydney, N. S. W. INDUSTRIAL FINISHING magazine has been handed to me by Sherwin-Williams, and on the day of writing this letter we have forwarded a check to Gordon & Gotch A'sia Ltd., representing 12 months subscription to your very valuable publication.

In the meantime, if you can gather any information on detearing and electrostatic dust-proofing or anything dealing with the question, we would appreciate getting it.—G. M. & D. Co.

The NEW No. N-3 "ELECTRO-KNIFE" by FINISHINE

"Registered and Copyrighted"

PRICES

6 or more @ $10.35 each
12 or more @ $10.00 each
Single Knife @ 10.85 each
FOB Syracuse, N. Y.

Our Latest Model Electric Burning-In Knife for use with FINISHINE LACSTIX, PORCELSTIX, SHELSTIX, etc. Featuring the air-cooled Cork Handle, Tite-Grip Rubber Plug with 10 feet of rubber cord, Gripper Clip for hanging up. Light as a feather—designed for easy handling!

Our "ELECTRO-KNIFE", Electric Burning-in Knife, was complimentarily featured in "Industrial Finishing" explaining its excellent features.

Its purpose is to burn in STIX—Stick Shellac, Stick Lacquer, Stick Porcelain, etc., and reduce Fire Risk. Much SAFER to use than the old style Alcohol Torch and Spatula in that it "PREVENTS FIRE" endangering Stock and Operators. It may be used on 110-120 Volt Circuit A.C. It has a new type of Refractory Core Construction with correct Heat Control which makes it practically impossible to burn out. Its maximum Thermostatically Controlled Heat is coordinated with the Stix Melting Point. A great Labor and Material Saver—"Stix-Mends" may be made neater, smoother and quicker. It comes equipped with a hand forged Copper Spoon Type Blade which may be bent or ground to any shape desired; copper being used as it will spread and fill in Lactix, Shelstix, Porcelstix, etc., with less adhesion. A high Grade Tool, Made Right and Guaranteed to Produce Satisfactory Results. No finisher's kit or work bench is complete without it.

Will include an off and on switch installed for $1.00 extra.

Also Famous Brands of BURNING-IN-STIX

Special **Lacstix** is made of the finest materials, and will not lift or shrink in or under lacquer. Is free of color specks. Made of special resins that withstand the fast solvenizing action of high powered solvents used in modern synthetic and lacquer finishes. Helps finisher repair surface in one operation.

Approx. size Porcelstix, 3½x⅝x⅜; balance of brands 7¼x ⅝x⅜ packed 12 all one color, or assorted to package.

Special **Shelstix** is made from the choicest shellac gums and resins, and will be found far superior to many brands of shellac sticks. If you haven't tried this Finishine SHELSTIX, you will be wise to put in an order right away, to make certain that your repair work will be of the highest grade.

Porcelstix is the item you can depend upon to repair chipped porcelain, marble or tile. Does it within ten minutes. Easy to use and comes in assortment of fourteen permanent colors. Porcelstix is made from a unique combination of special resins that puts it in the high quality class. Is waterproof and will stand tremendous amount of heat.

FINISHINE LABORATORIES, INC.

SYRACUSE 4, NEW YORK

Startling Invention—A discovery rated by *Time* as one of the most exciting in years has been announced by the John B. Pierce Foundation. This organization, devoted entirely to housing research, has perfected a system called "liquid heat" which combines in one unit all the heat and power needed for home heating, cooking, refrigeration and lighting.

Instead of using water or steam, a chemical solution known as tetracresyl silicate is employed. This revolutionary formulation can be heated to 817°F., and it may eventually reduce the cost of house utilities by almost 50%.

* * *

Lessons of War—Evidently trying to prove the old saying that "Sweet are the uses of adversity," the committee headed by Senator Harley M. Kilgore has listed 1400 wartime technological developments that offer peacetime applications. Here are a few:

A new chemical process that reclaims rubber in 12 hours.

Hardwood, cross-grained and bonded to leather under pressure by means of a plastic, which has been successfully used in making women's shoes.

Prefabricated houses with "packaged" kitchens, bathrooms and heating units, with durable plastic or plywood walls, which have been delivered and welded on the site with techniques now used in shipbuilding.

Waste liquors from paper mills and other industrial plants—as well as sawdust, straw, cornstalks and other farm wastes—all of which contain sugar that is now being converted into alcohol.

Small tubular rivets of plastic which are as satisfactory as metal for use in bookbinding and other trades.

* * *

Sizing Up Sales—An indication of the staggering volume of appliance sales in prospect for American manufacturers is contained in a survey released by the War Production Board. Basing its estimates on a questionaire circulated among 4500 families throughout the country, Washington comes up with these arresting figures:

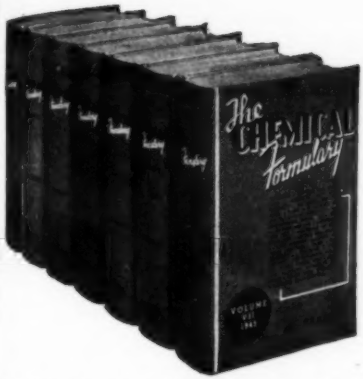
Almost six million refrigerators, five million electric irons, six million washing machines, five million radios, and equally substantial quantities of sewing machines, vacuum cleaners and other household goods.

The WPB emphasizes the point that these totals do not include the needs of apartments and proposed new housing. The grand total of prospective business, therefore, assumes really impressive proportions.

* * *

Warning on Boom—"The postwar inflation threat will be the first major crisis the building industry will have to meet." That is the stern prediction of Thomas S. Holden, president of the F. W. Dodge Corp. He points out that construction costs are today about 30% higher than in the year 1939, and that both wages and material prices are likely to rise further after ceilings are lifted.

Even if the postwar inflation haz-



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EDITOR-IN-CHIEF, H. BENNETT

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From thermoplastic adhesives to insecticides, from leather dressings to vegetable preservation, from invisible inks to refractories, from anti-freeze solutions to metal finishes—this valuable book describes and explains the latest commercial methods and processes.

It will keep you up-to-date with the newest developments and trends. It will bring you a great fund of ideas, information, data and formulae that would otherwise be accessible only after consulting dozens of books.

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Rubber & Latex	Furs	Animal Remedies	Skins	Marking Compositions
Adhesives	Automobile Specialties	Welding	Boiler Compounds	Soaps
Polishes	Removing Stains	Insecticides	Glass	Cleaners
Lubricants	Bleaches	Pharmaceuticals	Textiles	Waterproofing
Drugs	Ceramics	Oils & Fats	Fibres	Metals
Farm & Garden Specialties	Deodorants	Liquors	Beverages	Alloys
Resins	Disinfectants	Dyeing & Coloring	Flavors	Glues
Cements & Concrete	Laundry Specialties	Fluxes	Rustproofing	Pastes
Synthetic Resins	Dental Products	Explosives	Metal Treatments	Fireworks
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		Leather	Inks	

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CUMULATIVE INDEX

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INDUSTRIAL FINISHING Magazine

1142 North Meridian Street **Indianapolis 4, Ind.**

ard is successfully passed, he maintains, costs will remain a critical factor in determining the size of the construction market. "If it proves possible to make the necessary adjustments of costs in an orderly manner," Holden adds, "a great difficulty—possibly a great disaster—will be averted."

* * *

Bright Magnesium Outlook—Among all the tonnage metals, magnesium is unique for the simple reason that its supply is literally unlimited. One cubic mile of sea water produces 9,000,000-lbs. of the raw metal, and not even the gloomiest of our crystal-gazers dares predict a postwar disappearance of our oceans.

A campaign to stimulate public interest in magnesium for such products as typewriters, kitchen utensils and furniture is being undertaken by the Magnesium Association. "Although industry during the war recognized that the use of magnesium eliminated unnecessary weight," says T. W. Atkins of the trade group, "there is every reason to believe that the machinability and strength of magnesium, as well as its lightness, will be more widely recognized."

* * *

Competition in Rubber—Estimating that the postwar cost of natural rubber will range from 13 to 15 cents a pound, L. R. Jackson of the Firestone Tire and Rubber Co. contends that the synthetic product will be able to hold its own in the coming trade battle. It should be possible, he believes, to produce home-made rubber in the near future for 15 cents.

"This would not prohibit competition," declares Jackson, "especially in the many fields in which synthetic rubber has already proven its superiority." Although a surplus may eventually exist, he believes that all the rubber available from both sources will be needed for several years after the end of hostilities.

* * *

Can Makers Are Ready—In the opinion of D. W. Figgis, president of the American Can Co., the industry he represents has no particular conversion problem that cannot be readily solved by the time steel is freely available at the mills.

James A. Stewart, vice president in charge of research at American Can, is highly optimistic about the outlook for tin containers in the postwar period. Many new industries intend to pack their products in tin, while many others which have been forced to use substitutes during the war are planning to return to their former sources. Stewart cites the meat packers, coffee producers, brewers and oil companies as important peacetime customers.

* * *

Radio Bottleneck Feared—Some harsh words were addressed to members of his industry recently by S. J. Novick, president of the Electronic Corp. of America. Demand for component radio parts, he stated sharply, seems limited only by "the over-stimulated imaginations of inexperienced manufacturers," who have been nourished on an inexhaustible wartime market.

Novick insists that chaos will prevail in retail distribution unless anarchy is prevented in the ordering of materials. He has called on the Radio Manufacturers Association to formulate a workable plan for organizing production and deliveries throughout the industry, in order to assure a reasonable balance for all factories.

Just for the Record

REMEMBER THESE NAMES

After V-day they will mean something to you!

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A complete line of cellulose derivative lacquers and enamels.

▼

FORM-A-ROC

A unique line of quick-baking, tough adhesive synthetic enamels.

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THE VARNISH PRODUCTS CO.

5208 Harvard Avenue Cleveland, Ohio

Liquid Waterproofing — A new material of interest to industry has been introduced by U. S. Industrial Chemicals, Inc. Known as "PiB", the material can be easily applied to motors stalled by flood or rain, permitting immediate starting.

"PiB" was originally developed as a wartime item for use in waterproofing the ignition systems and batteries of jeeps, tanks, trucks and amphibious vehicles. Now the manufacturers are planning to offer it commercially for peacetime use in automobiles and for all types of electric motors.

* * *

Profit Point—As many business men have begun to discover, there can be such a thing as profitless reconversion. The automobile industry maintains that it will need eight months after its war contracts are cancelled to build enough passenger cars to make money. This would mean a minimum output of two million units a year.

An interesting roundup of the estimates of other industries has been prepared by the Associated Press. This news association lists the "break-even" estimates of numerous manufacturers as follows: pianos, 7 months; sewing machines, 6 months; refrigerators, 6 months; electric ranges, 5 months; and washing machines, 4 months.

* * *

Gloomy Furniture Prospects — You may have read the rosy statement made some weeks ago by Roscoe R. Rau of the National Retail Furniture Association, forecasting a great increase in the production of home goods in the immediate future. Many spokesmen

of the industry have been quick to refute his optimism.

Even though the manpower situation in the plants themselves may be easing, it is pointed out that lumber inventories are near the vanishing point, and that woods used in most furniture manufacturing must be seasoned for nearly a year. In the case of upholstered furniture, the chief bottleneck for some time, we are reminded, has been a shortage of fabrics rather than of lumber.

* * *

Service to Readers—Through the courtesy of many leading industrial organizations, free tickets to numerous radio broadcasts are available to readers of INDUSTRIAL FINISHING. When planning a visit to Manhattan, drop a line to: *Lawrence H. Singer, 130 West 86th Street, New York 24, New York.*

Among the cooperating sponsors are: Prudential Insurance Co. ("The Family Hour"); Campbell Soups ("Radio Reader's Digest"); and P. Ballantine and sons ("Three-Ring Time.").

Deferred maintenance jobs, most of which will require paint, have been estimated as high as $30,000,000,000.

Rollin H. Wampler Joins Jones-Dabney Co.

The Jones-Dabney Co., Louisville 10, Ky., announces that Rollin H. Wampler has joined its organization in the capacity of Assistant Manager of the Wood Finishes Division. Mr. Wampler, a Tau Kappa Alpha and graduate of Bridgewater College, was formerly Technical Director of a finishing materials manufacturer in Roanoke, Va. He was recently elected chairman of the Virginia Blue Ridge Section of the American Chemical Society, and he is the author of numerous technical papers on finishing problems. His new book, "The Industrial Application of Modern Organic Finishes," will be published by the Chemical Publishing Co. this fall.

R. H. Wampler Becomes Assistant Manager of Wood Finishes Division for Jones-Dabney.

The company believes that in the postwar years chemistry will play a more important part in the development of wood finishes than ever before, and that the quality wood finishes of the future will be products of laboratory research by highly trained technicians. The expansion of the Wood Finishes Division of the Jones-Dabney Company has been under way for some time, and securing the services of Mr. Wampler is an important step in this development.

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WOOD BLEACH
Also For
Interior Woodwork Recoloring
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Patent Licensee
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OKINAWA IS SECURED

AFTER A LONG AND bloody battle, Okinawa will shortly become our strongest advanced bastion for further attacks against the Japanese Empire. The experience and knowledge gained in this battle indicates that prodigious quantities of equipment and war materiel will be required for the final assault against Japan.

There must be no letup in our efforts on the home front in order to keep our mounting attack in the Pacific well supplied with men and materiel.

Listed here are a few of the war products now being coated with our materials. Phone, wire or write and let one of our finishing experts help you "keep production rolling."

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Samples Sent in Order Received.
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ST. LOUIS 3, MO.

Colors Produced by Mixing Paints

THE Public Relations Dept. of the National Paint, Varnish & Lacquer Association, Washington, D. C., lists a wide range of tinted paints or enamels that can be produced by adding certain available colors to white. It is all accomplished by a careful addition of properly selected colors in oil, which usually come in tubes, small jars or small cans. The chief requisite is a good eye for color, care in very gradually adding the modifying colors, and foresight in mixing enough paint at one time for the job in order to avoid any future matching perplexities.

Either colored or white paint or enamel can be tinted. Colored paint or enamel may need only a slight modification. If you start with white enamel or paint a wide range of tints can be achieved by carefully following those of the following suggestions which apply to tinting white paint or enamel:

Creams: Pale, light and dark may be made by adding raw sienna to white paint or enamel. Vary the amount to suit your color preference.

Grayed Cream: Add a trace of lampblack to cream.

Ivory: Add a very little raw sienna and a trace of vermillion or a little yellow ochre and a trace of venetian red to white.

Pale Tan: Add a small amount of burnt umber to white.

Creamy Tan: Add a little raw sienna to the foregoing mixture.

Ecru: Add medium chrome yellow and a little toludine red to white.

Buff: Quite a little raw sienna added to white makes a buff.

Maize: Add a considerable medium chrome yellow and some lemon chrome yellow to white.

Sand: Add yellow ochre and a trace of black and vermilion to white.

Fawn: Add burnt umber and yellow ochre to white.

Pale Yellow: Add a little chrome yellow or medium to white.

Colonial Yellow: Add French ochre and medium chrome yellow to white. Use approximately twice as much ochre as chrome.

Gold: Add considerable light chrome yellow and a little venetian red to white.

Orange-Yellow: Add chrome yellow medium and very little vermilion to white.

Pale Orange: A small amount of vermilion and chrome yellow added to white.

Grayed or Burnt Orange: Add vermilion and chrome yellow to white. Gray it off with a trace of Prussian blue.

Topaz: Add orange chrome yellow or chrome yellow medium and

DAVIDSON ENGINEERING SERVICE
Consultant Engineers
Conveyor Systems Labor Saving Devices
Plant Layout
Designers of Special Equipment
Address: Box 2941
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Remove Production Line Dust, Lint, and Sand Particles with this Soft Tacky Cloth before applying finish.
CRYSTAL TACK-RAGS
Gross Lots Available Thru Paint Dealers or from the Processor.
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The favorite of users everywhere to guard against paint spray vapors and nuisance dusts! Made of soft, high grade rubber, foldable, reversible, fits any shaped face. Equipped with face cloth, it presents the utmost in comfort. Weighs only 4 ozs. Does not hinder conversation. Price $19.80 doz.

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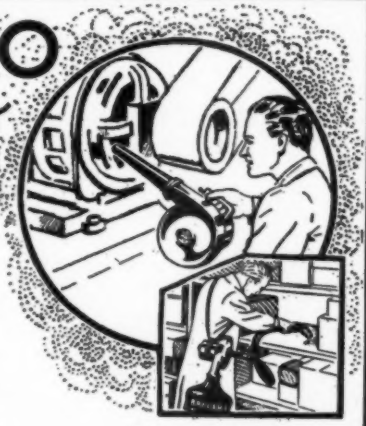

DUST will be LESS of a problem with the TORNADO Portable Electric Blower to blow it out of motors, generators, shafting, bearings, etc. TORNADO blows out dust, dirt, lint—with its swoosh of clean, dry air.

Powerful 1 h.p. universal motor makes it easy to clean largest motors or generators without dismantling them. Plugs in at any electric outlet.

Costs less than 3c an hour to operate. Weighs only 14 lbs. Investigate!

Write for details and FREE TRIAL Offer

TORNADO

BREUER ELECTRIC MFG. CO.
5094 N. Ravenswood Ave., Chicago 40

a little vermilion to white.

Peach: Add chrome yellow and a little vermilion to white.

Pink: Add a small amount of vermilion to white.

Rose: Add vermilion, turkey red or rose lake, very little at a time until the desired shade is produced.

Salmon: Add considerable deep orange chrome to white. To meet some preferences, it may be necessary to add a trace of Prussian blue to gray it off slightly.

Coral: Add chrome yellow medium and a little vermilion to white.

Red Brick: Add considerable venetian red and about half as much Indian red to white.

Red, Dark: Add a bit of lampblack to brick red.

Maroon: Add venetian red, a little black and a trace of Prussian blue to white.

Brown: Add venetian red if reddish brown is desired, to burnt umber paint. Add white if a lighter brown is wanted.

Brown, Light Yellowish: Add chrome yellow and burnt umber to white.

Brown, Reddish: Add burnt umber and venetian red to white.

Brown, Cinnamon: Add raw sienna and golden ochre to white, more sienna than ochre.

Green: Medium chrome green and medium chrome yellow added to white in varying amounts to get desired depth of color.

Soft Green: Add chrome yellow, chrome green and raw sienna to white.

Green, Pale: Tint white with chrome green medium and a touch of chrome yellow medium. Deeper green, same tinting colors, but larger quantities.

Green, Apple: Add light chrome green and orange chrome to white.

Green, Sea: Add deep chrome green to white.

Green, Adam: Add medium chrome green and a little Chinese blue to white.

Green, Jade: Add considerable chrome green, a little Prussian blue and a little venetian red to white.

Yellow Green: Tint white with chrome green medium and a touch of chrome yellow medium, varying the quantities of yellow to get the desired shade.

Soft Yellowish Green: Add medium chrome green, raw sienna, and a trace of medium chrome yellow to white.

Green, Olive: Add chrome yellow and lampblack to white.

Green, Nile: Add Prussian blue and emerald green to white, about three times as much color as white.

Gray-Green: Add varying amounts of chrome yellow and chrome green to white, and gray it off with a little venetian red.

Blue-Green: Add Prussian blue

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Detroit Handy Tac Rags
will solve your problem. Remain tacky indefinitely. Non-combustible. At your Paint Dealer or write to Manufacturer.
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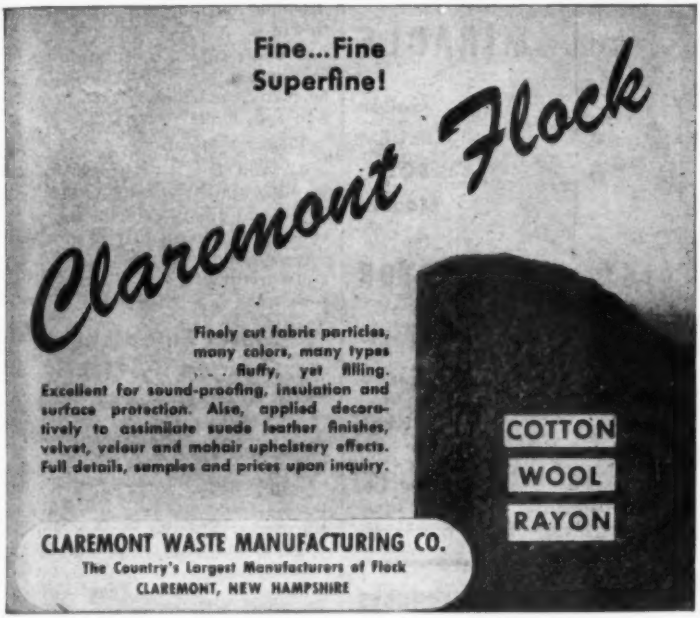
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Excellent for sound-proofing, insulation and surface protection. Also, applied decoratively to assimilate suede leather finishes, velvet, velour and mohair upholstery effects. Full details, samples and prices upon inquiry.
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CLAREMONT WASTE MANUFACTURING CO.
The Country's Largest Manufacturers of Flock
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and chrome green to white, in varying quantities to produce light, medium or dark as desired.

Blue, Pale: Add a very little Prussian blue to white.

Deeper Blue: Add more of same color.

Delft Blue: Add cobalt blue and a touch of lampblack to white.

Gray-Blue: Add Prussian blue and lampblack or, for a livelier color, Prussian blue and some orange chrome, to white.

Gray: Add lampblack to white, very gradually until you obtain the desired shade.

Silver Gray: Add a trace of lampblack and raw umber to white and, if you prefer, a trace of raw sienna also.

Gray, Pearl: Add chromium oxide (green) and iron oxide (red) to white.

Gray, French: Add Prussian blue to gray.

Gray, Stone: Add raw sienna and raw umber to white.

Limestone Gray: Add raw sienna and raw umber to white.

Mauve-Gray: Add rose lake and some cobalt blue to white; gray off with a trace of lampblack.

Pale Lavender: Add about three parts of ultramarine blue and one part madder lake to white.

Grayed Lavender: Add ultramarine blue and madder lake to white, graying it off by adding a little chrome yellow.

Lilac: Add a small amount of

MIRACLE

5 Gallon BLUE BOY Model

PAINT REJUVENATOR

Restores Paints, Lacquers, Enamel Products and Pigment Primers, to original consistency in 3 to 10 minutes without opening the can. Available for Round or Square 5-gallon cans. Explosion-proof electrical equipment if desired. Also other units from ¼-pint to 50-gallon drum capacity available. Originators of Paint Rejuvenating equipment—ten years—thousands of satisfied users.

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FINISHING METAL PRODUCTS

337 pages, 6x9, illustrated, $3.50

BESIDES fully describing modern shop technique, this book coordinates metal finishing processes and finishing problems with the over-all problem of manufacture. The usual types of finish, such as galvanizing, polishing, plating, lacquering, and painting are thoroughly treated, as well as many new finishes of a specialized nature. An important feature of the book is the section on cleaning and descaling. Throughout, both technical and commercial aspects are considered in detail in an endeavor to point the way to more attractive metal finishes and to more efficient means of producing them.

Industrial Finishing
1142 N. Meridian St. Indianapolis 4, Ind.

ultramarine blue and rose madder to white.

Orchid: Wisteria and lavender are basically violet-red. They can be mixed satisfactorily from white and rose pink.

Please remember!

1) Add the tinting colors little by little until the color is right.

2) Add plenty of "elbow grease" by stirring thoroughly to eliminate any possible streakiness in the tinted paint.

Metal Smoothness Gauged by Plastic

THE smoothness, or degree of finish, of metal parts can now be rapidly and satisfactorily determined by the use of nearly transparent plastic replicas, following methods developed by the National Bureau of Standards, Washington, D. C., and acceptable modes of specifying and designating surface finish will probably result. Metal smoothness specifications have been lacking in the past because no easy method of evaluating them had been worked out.

The new method, described by Harry K. Herschman of the bureau staff in mechanical engineering, consists of applying a suitable solvent to the metal surface, then pressing on a strip of clear plastic film. The solvent softens the side of the film adjacent to the surface being examined and permits it to flow and conform under the pressure to the minute surface irregularities. The film dries in about a minute and can then be stripped off readily, giving a perfect facsimile of the surface.

After a replica is made, its degree of transparency depends upon its roughness; increased roughness results in decreased transparency.

Look at That!

That is a slab of overspray deposit—over ⅛ inch thick—peeled off the wall of a spray booth after a month's use. Note how smooth the back—that's because the walls were protected with

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Booth-Kote—a pigmented paste of brushing consistency—enables you to clean and recoat a booth in less than 2 hours. It is so easy that a boy will enjoy the job.

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and when loaded with paint and lacquer overspray—

JUST SCRAPE IT OFF
with a putty knife or scraper—as easy as peeling an orange.

One gallon is enough for an average booth, tunnel and fan blades—and should last a month.

Packed in 5 gallon pails at $1.25 per gal. F.O.B. Chicago. Mail your order today.

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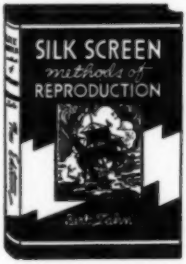

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INFRA-RED ENGINEERS & DESIGNERS
1822 E 40th STREET - CLEVELAND, OHIO

Also, the rougher the metal surface the more pronounced are the variations in the regularity of the reproduced pattern. This fact led to the development of apparatus for evaluating surface roughness, based upon the degree of variation of the geometric characteristics in a nearly transparent replica.—C. F.

Fixtures Hold Small Parts for Spraying

FURTHERING its "putting scrap to work" activity, The Glenn L. Martin Co., Baltimore, Md., has discovered a new use for corrugated steel scrap strips. Employees in the finishing and plating department are now using them in various widths and corrugation dimensions to hold small parts while they are being painted in the automatic conveyor sprayers and on the hand sprayer racks.

Making the strips available in many sizes prevents even the smallest of parts from being blown out of line by the force of the spray as was the case when fine mesh screen racks were used. The new method also proves more satisfactory than the gummed tape method

Placing wooden knobs on narrow strips of corrugated metal, to hold them in position for spray coating.

because it holds parts with curved surfaces more securely than does the tape.

The new method results in considerable time-saving in moving the parts to the drying racks, plus the fact that the strips can be used for many operations before cleaning becomes necessary. It also eliminates the cost of gummed tape which was used prior to this time. —PUBLIC RELATIONS.

It would seem to us that these almost egg-shaped wood parts could be coated more quickly and more economically by dip-whirling (April issue, page 31) or by tumbling or by straight dipping, than by either hand or automatic spraying—that is if they are to be coated all over. None of these methods would require that careful handling, piece by piece, before and after spraying. In fact, spraying them on a rack as shown in the picture might require that each piece be handled individually three times — once to place it on the rack in the white, once to turn it over so the underside could be painted, and once to remove it after final painting.—ED.

Ordinary ventilation does not eliminate the localized fire hazards created by volatile flammable solvents. Special precautions must be taken to prevent the ignition of spills, creeping vapors which may travel 100-ft. or more from the point of origin, vapors collected in low places such as pits or basements, and the explosive vapor-air mixtures that remain in containers emptied of solvents.

Even when used in small quantities, flammable solvents require careful handling.

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100 — 55-gal. drums Forbes Dark Grey Baking Primer @ 40c.

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Index to Advertisers

Advance Paint Co. ..... Third Cover
American Chemical Paint Co. 29
American-Marietta Co. 91
Aluminum Industries, Inc. 31
Arco Co., The 47

Ballou Co., Edward C. 12
Baughn Chemical Products Co. 136
Beckwith-Chandler Co. 59
Behlen & Bro., Inc., H. 20
Berry Brothers 83
Binks Mfg. Co. 66-67
Breuer Electric Mfg. Co. 137

Celanese Chemical Corp. 10-11
Cellusuede Products, Inc. 15
Claremont Waste Mfg. Co. 139
Classified Advertising 143
Clinton Company, The 80
Commercial Solvents Corp. 24
Cover, H. S. 137

Davidson Engineering Service 136
Day & Co., James B. 16
Despatch Oven Co. 39
Detroit Surfacing Machine Co. 25
Detro Sales Co. 138
DeVilbiss Co., The 40-41
Dolan & Co., V. J. 5
Doster & Co. 141
DuPont de Nemours & Co., E. I. 76-77
Duralac Chemical Corp. 115

Eclipse Air Brush Co. 43
Egyptian Lacquer Mfg. Co. 49
Electric Sprayit Co. 87
Enterprise Paint Mfg. Co. 95
Enthone Company, The 1

Finishine Laboratories, Inc. 129

George Co., The P. D. 125
Glidden Co., The 19
G. M. Manufacturing Co. 12

Hercules Powder Co. 6-7
Hilo Varnish Co. 127
Horn Company, A. C. 14

Illinois Bronze Powder Co. 35
Industrial Chemical Development Corp. 5
Industrial Oven Engineering Co. 138
Infra-Red Engineers & Designers 142

Johnson & Son, S. C. 73

Kirk & Blum Mfg. Co. ..... Back Cover
Koch Sons, Inc., George 13

Lacquer & Chemical Corp. 117
Lawrence-McFadden Co. 135
Lea Manufacturing Co. 74
Liebich Co., G. J. 142
Lilly Varnish Co. ..... Front Cover
Lowe Brothers Co. 22

Maas & Waldstein Co. 53
Mahon Co., The R. C. 37
Mearl Corporation, The 111
Mine Safety Appliance Co. 8
Minn. Mining & Mfg. Co. 21
Miracle Paint Rejuvenator Co. 140
Mitchell-Mayer Co. 135
Monsanto Chem. Co. 105
Murphy Finishes Corp. 65

New Wrinkle, Inc. 55
New York Woodfinishers Supply Co. 101
North Amer. Elec. Lamp Co. 134

Oakite Products, Inc. 33
O'Brien Varnish Co. 45

Perfection Paint & Color Co. 9
Peters-Dalton, Inc. 23
Pittsburgh Plate Glass Co. 18
Pratt & Lambert, Inc. 113

Qualatone Products Co. 97

Randolph Finishing Products Co. 121
Rayon Processing Co. of R. I. 107
Reliance Varnish Co. 89
Ross Engineering Corp., J. O. 19
Rockford Varnish Co. 123
Roxalin Flexible Finishes, Inc. ..... Second Cover

Sherwin-Williams Co. 70-71
Standard Industrial Products, Inc. 93
Standard Varnish Works 57
Stanley Chem. Co. 109
Stille-Young Corp., The 79

United Lacquer Mfg. Corp. 103

Valvoline Oil Co. 8
Van Allen Co., L. R. 134
Varnish Products Co. 133
Verd-A-Ray Corporation 17
Vita-Var Corp. 85

Walker Co., H. V. 119
War Loan Drive 141
Watson-Standard Co., The 99

Zapon Division—Atlas Powder Co. 2

HING
117
135
74
142
Cover
22
53
37
111
8
21
140
135
105
65
55
101
134
33
45
9
23
18
113
97
121
107
89
19
123
Cover
70-71
93
57
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On the Firing Line OUR BOYS HAVE Come Through...

On the "Finishing Line" ADVANCE Comes Through...

FIRST it was Wake, then Bataan, Coral Sea, Midway, Solomons—then it was Africa, Italy, France and Germany itself—thus ending the war in Europe. Next it was Leyte, Manila and Okinawa . . . and now the next step is Japan. Just as our boys have come through on the firing line all over the world . . . on land, sea and air . . . so have we here at Advance come through on the "Finishing Line". We have done our part in the war effort (and we'll continue) but we're also ready to help you switch back to non-war products when you have to.

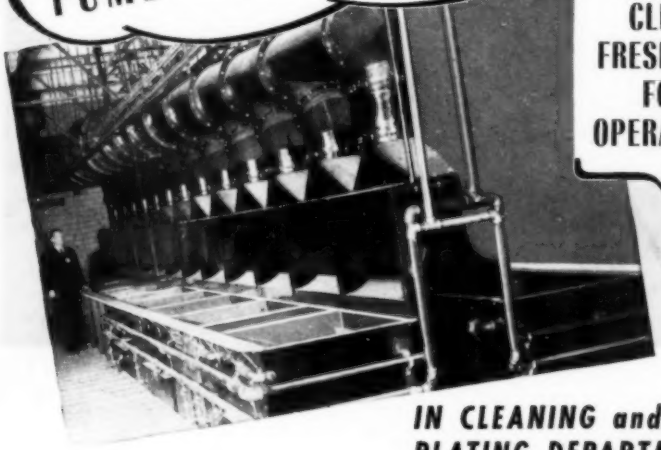
ADVANCE PAINT COMPANY

Manufacturers of Wood & Metal Finishing Materials

INDIANAPOLIS, INDIANA

KIRK & BLUM FUME EXHAUST *System*

ASSURES CLEAN FRESH AIR FOR OPERATORS



IN CLEANING and PLATING DEPARTMENT

Shown in the above photograph is one of three exhaust systems designed and installed by Kirk & Blum in the cleaning and plating department of a large manufacturer of electrical equipment.

This installation using a manifold type exhaust, insures maximum visibility. The cross draft feature removes fumes centrally from double row of tanks, assuring continuous clean fresh air for operators.

Approximately 70,000 C. F. M. of air is handled with special type axial flow fans and the discharge from these fans is directed to a vertical stack outside of building dissipating the fumes at a high altitude.

This system is so designed as not to interfere with ease in handling parts, either by hand or monorail above, as they are processed. Electrical insulation is created by non-conductive strips along edges of tanks on which hoods are mounted.

Let the professional experience of Kirk & Blum Engineers be your guide in the selection of a fume exhaust system made to meet your individual requirements. Write to

The KIRK & BLUM MFG. CO.

2831 SPRING GROVE AVE. CINCINNATI 25, OHIO